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KEY TO  
COMPLETE ARITHMETIC

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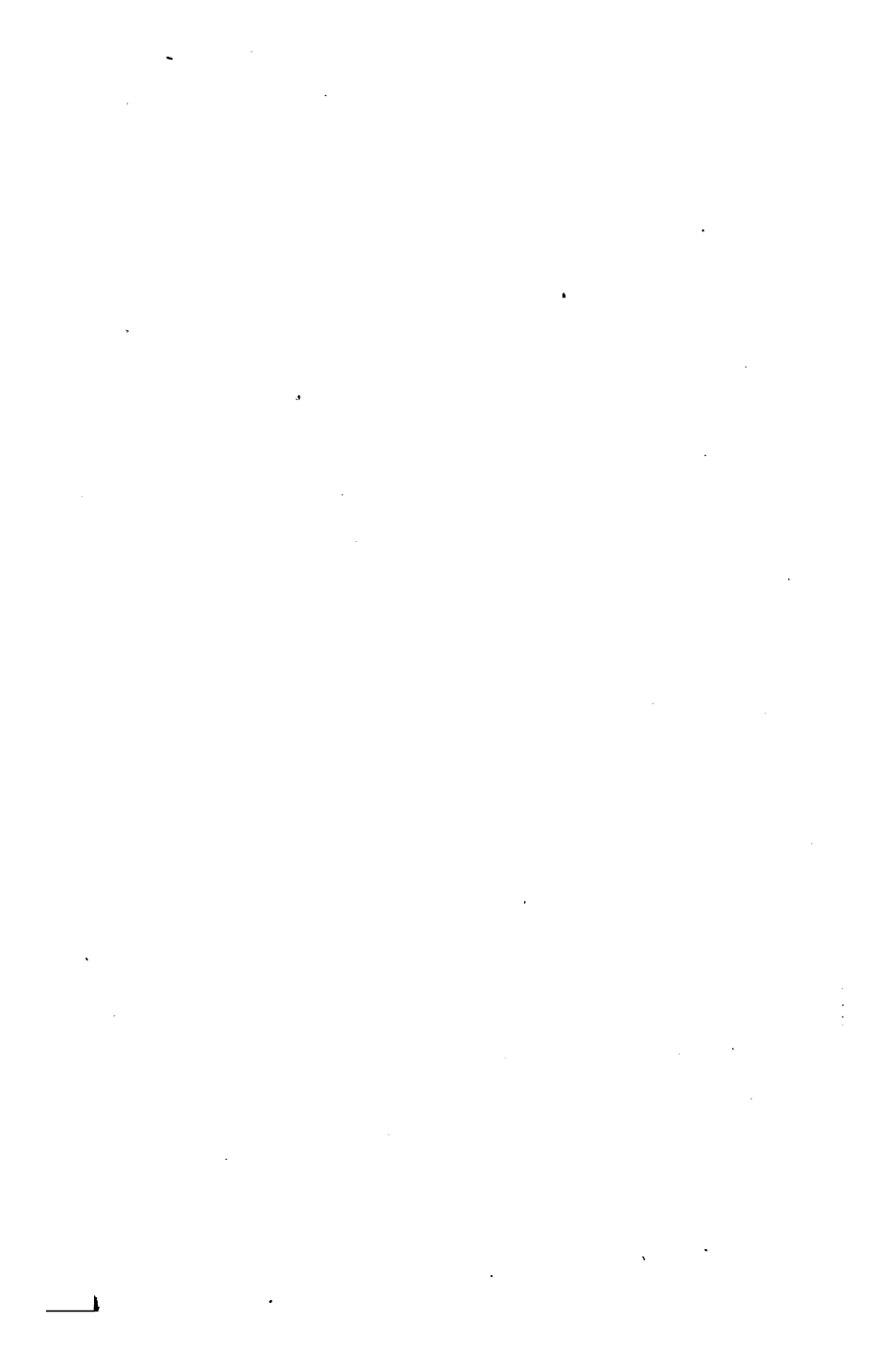
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° KEY  
TO  
COMPLETE  
ARITHMETIC.

ON THE BASIS OF WORKS

By BENJAMIN GREENLEAF, A.M.

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# KEY TO THE COMPLETE ARITHMETIC.

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## Article 37.

44. 1009.	49. \$ 499.	81. \$ 31.355.
45. 669.	50. \$ 1465.	82. \$ 39.928.
46. 698.	79. 1484.	83. \$ 61.665.
47. 759.	80. 1149.	84. \$ 317.40
48. \$ 989.		

## Article 39.

85. 689.	103. 176.40.	121. 24445.
86. 1978.	104. 153.89.	122. 313.54.
87. 2396.	105. 281.72.	123. 150.390.
88. 15485.	106. 5233.97.	124. 29002 ft.
89. 2052.	107. \$ 125.65.	125. 3578392.
90. 9788.	108. \$ 511.69.	126. \$ 1046.87.
91. 2018.7.	109. \$ 168.08.	127. \$ 175430.
92. 143.91.	110. \$ 532.40.	128. 62611.
93. \$ 131.31.	111. 998.	129. \$ 39320.
94. \$ 100.66.	112. 4391.	130. 1323925.63.
95. \$ 393.30.	113. \$ 9665.68.	131. 1863189.
96. \$ 230.05.	114. 5619.	132. 563972744718.
97. 3018.	115. \$ 75.13.	133. 509006545503.418.
98. 3443.	116. 318381.	134. 323497.
99. 7736.	117. \$ 145.17.	135. 340522022.
100. 2023.	118. \$ 360.	136. 1380855.262.
101. 2026.	119. \$ 14170.70.	137. \$ 32545.24.
102. 16986.	120. 2815	138. \$ 24005.79.

**Article 46.**

<b>45.</b> 332.	<b>51.</b> 2213.	<b>78.</b> 192.
<b>46.</b> 223.	<b>52.</b> 1118.	<b>79.</b> 46.65.
<b>47.</b> 205.	<b>53.</b> 1221.	<b>80.</b> 803.153.
<b>48.</b> 222.	<b>54.</b> \$ 325.	<b>81.</b> \$ 391.05.
<b>49.</b> 1114.	<b>76.</b> 309.	<b>82.</b> \$ 55.14.
<b>50.</b> 3212.	<b>77.</b> 192.	<b>83.</b> \$ 338.80.

**Article 48.**

<b>84.</b> 5196.	<b>97.</b> 34456.	<b>109.</b> 5541.
<b>85.</b> 4969.	<b>98.</b> 97820.	<b>110.</b> 26983.
<b>86.</b> 1859.	<b>99.</b> 22968.	<b>111.</b> 11001.
<b>87.</b> 1056.	<b>100.</b> 9903.	<b>112.</b> 107.91.
<b>88.</b> 29962.	<b>101.</b> 9154.	<b>113.</b> 389.
<b>89.</b> 3541.	<b>102.</b> 1.	<b>114.</b> \$ 740.75.
<b>90.</b> 56.39.	<b>103.</b> 6.552.	<b>115.</b> 163864.
<b>91.</b> 14.251.	<b>104.</b> 811.95.	<b>116.</b> \$ 4066.94.
<b>92.</b> \$ 6.27.	<b>105.</b> 9615.5.	<b>117.</b> 269535.
<b>93.</b> \$ 83.96.	<b>106.</b> 78.44.	<b>118.</b> 267369.
<b>94.</b> \$ 95.81.	<b>107.</b> \$ 486.57.	<b>119.</b> 1785837.
<b>95.</b> \$ 29.99.	<b>108.</b> \$ 1836.75.	

**MISCELLANEOUS EXERCISES.**

<b>120.</b>		<b>121.</b>	
\$ 190.00	\$ 767.50		\$ 3769.00
131.00	476.25	\$ 1728.00	2648.75
155.25	\$ 291.25, Ans.	1161.93	\$ 6417.75
<u>\$ 476.25</u>		<u>\$ 2889.93</u>	2889.93
			<u>\$ 3527.82, Ans.</u>

**122.**

1882	991	1882	1882
<u>991</u>	<u>431</u>	<u>1422</u>	<u>1602</u>
891, 1st Ans.	1422	460, 2d Ans.	280, 3d Ans.

**123.** \$ 178.50, Sydney.

75.75
<u>\$ 254.25</u> , Albert.
178.50
<u>432.75</u>
80.93
<u>\$ 351.82</u> , Charles.
178.50
<u>\$ 173.32</u> , Ans.

**124.**

1645
635
<u>416</u>
2696
<u>1314</u>
1382, Ans.

**125.**

1575	4563
1658	3233
<u>3233</u>	Ans. <u>1330</u> mi.

**126.** \$ 8555.50

7000.00
9563.75
<u>20000.00</u>
\$ 45119.25

**127.**

362535	847542
<u>104760</u>	<u>467295</u>
467295	380247, Ans.

\$ 50675

<u>45119.25</u>
\$ 5555.75, Ans.

**128.**

\$ 51.75
84.93
<u>267.00</u>
\$ 403.68

\$ 1250.00

<u>403.68</u>
846.32
<u>185.00</u>
\$ 1031.32, Ans.

**Article 58.**

- |                   |                    |                         |
|-------------------|--------------------|-------------------------|
| <b>38.</b> 3024.  | <b>44.</b> 86415.  | <b>50.</b> 49899.71.    |
| <b>39.</b> 13701. | <b>45.</b> 218709. | <b>51.</b> \$ 497.40.   |
| <b>40.</b> 5545.  | <b>47.</b> 280.56. | <b>52.</b> \$ 1155.282. |
| <b>41.</b> 49608. | <b>48.</b> 30.675. | <b>53.</b> \$ 6588.     |
| <b>42.</b> 20496. | <b>49.</b> 3271.8. | <b>54.</b> \$ 76838.76. |
| <b>43.</b> 5216.  |                    |                         |

<b>81.</b> 763	<b>82.</b> 1345	<b>83.</b> 406
37	45	25
<u>5341</u>	<u>6725</u>	<u>2030</u>
2289	5380	812
<u>28231, Ans.</u>	<u>60525, Ans.</u>	<u>10150, Ans.</u>

<b>84.</b> 1621	<b>85.</b> 134.7	<b>86.</b> 17.58
34	86	285
<u>6484</u>	<u>8082</u>	<u>8790</u>
4863	10776	14064
<u>55114, Ans.</u>	<u>11584.2, Ans.</u>	<u>3516</u>
		<u>5010.30, Ans.</u>

<b>87.</b> 3.049	<b>88.</b> 25.75
329	703
<u>27441</u>	<u>7725</u>
6098	18025
9147	<u>18102.25, Ans.</u>
<u>1003.121, Ans.</u>	

**Article 60.**

<b>89.</b> 347	<b>90.</b> 826	<b>91.</b> 90.4
769	243	85
<u>3123</u>	<u>2478</u>	<u>4520</u>
2082	3304	7232
2429	1652	<u>7684.0, Ans.</u>
<u>266843, Ans.</u>	<u>200718, Ans.</u>	

- |   |  |  |
|---|--|--|
| <b>92.</b> \$32.13<br><u>91</u><br>3213<br>28917<br><u>\$ 2923.83, Ans.</u>                   | <b>93.</b> 456.7<br><u>68</u><br>36536<br>27402<br><u>31055.6, Ans.</u>                  | <b>94.</b> 8.901<br><u>542</u><br>17802<br>35604<br>44505<br><u>4824.342, Ans.</u>       |
| <b>95.</b> \$23.45<br><u>397</u><br>16415<br>21105<br>7035<br><u>\$9309.65, Ans.</u>          | <b>96.</b> 6789.0<br><u>645</u><br>339450<br>271560<br>407340<br><u>4378905.0, Ans.</u>  | <b>97.</b> \$198.06<br><u>805</u><br>99030<br>158448<br><u>\$ 159438.30, Ans.</u>        |
| <b>98.</b> 45.32<br><u>907</u><br>31724<br>40788<br><u>41105.24, Ans.</u>                     | <b>99.</b> 982.4<br><u>3004</u><br>39296<br>29472<br><u>2951129.6, Ans.</u>              | <b>100.</b> \$60.51<br><u>768</u><br>48408<br>36306<br>42357<br><u>\$ 46471.68, Ans.</u> |
| <b>101.</b> 87.35<br><u>94</u><br>34940<br>78615<br><u>8210.90, Ans.</u>                      | <b>102.</b> \$80.42<br><u>832</u><br>16084<br>24126<br>64336<br><u>\$ 66909.44, Ans.</u> | <b>103.</b> 30.69<br><u>907</u><br>21483<br>27621<br><u>27835.83, Ans.</u>               |
| <b>104.</b> \$817.42<br><u>358</u><br>653936<br>408710<br>245226<br><u>\$ 292636.36, Ans.</u> | <b>105.</b> 8.439<br><u>125</u><br>42195<br>16878<br>8439<br><u>1054.875, Ans.</u>       | <b>106.</b> 86491<br><u>683</u><br>259473<br>691928<br>518946<br><u>59073353, Ans.</u>   |

<b>107.</b> 49382 294 <hr/> 197528 444438 98764 <hr/> 14518308, Ans.	<b>108.</b> \$ 887.95 761 <hr/> 88795 532770 621565 <hr/> \$ 675729.95, Ans.	<b>109.</b> 4963 845 <hr/> 24815 19852 39704 <hr/> 4193735, Ans.
<b>110.</b> \$ 28.59 927 <hr/> 20013 5718 25731 <hr/> \$ 26502.93, Ans.	<b>111.</b> 938.42 347 <hr/> 656894 375368 281526 <hr/> 325631.74, Ans.	<b>112.</b> 61904 869 <hr/> 557136 371424 495232 <hr/> 53794576, Ans.
<b>113.</b> \$ 329.87 35 <hr/> 164935 98961 <hr/> \$ 11545.45, Ans.	<b>114.</b> 42935 942 <hr/> 85870 171740 386415 <hr/> 40444770, Ans.	<b>115.</b> \$ 864.23 346 <hr/> 518538 345692 259269 <hr/> \$ 299023.58, Ans.
<b>116.</b> 84917 809 <hr/> 764253 679336 <hr/> 68697853, Ans.	<b>117.</b> \$ 73.24 935 <hr/> 36620 21972 65916 <hr/> \$ 68479.40, Ans.	<b>118.</b> \$ 98.983 871 <hr/> 98983 692881 791864 <hr/> \$ 86214.193, Ans.
<b>119.</b> 295 163 <hr/> 885 1770 295 <hr/> 48085 lbs., Ans.	<b>120.</b> 1468 87 <hr/> 10276 11744 <hr/> 127716, Ans.	<b>121.</b> 681 507 <hr/> 4767 3405 <hr/> 345267 12 <hr/> 690534 345267 <hr/> 4143204, Ans.



<b>122.</b> 804.51	<b>123.</b> 914.08	<b>124.</b> \$82.50
63	64	25
<u>241353</u>	<u>365632</u>	<u>41250</u>
482706	548448	16500
<u>50684.13</u> , Ans.	<u>58501.12</u> , Ans.	<u>\$2062.50</u> , Ans.

<b>125.</b> 5414.015	<b>126.</b> 8304.5	<b>127.</b> 7038.61
38	77	126
<u>43312120</u>	<u>581315</u>	<u>4223166</u>
16242045	581315	1407722
<u>205732.57</u> , Ans.	<u>639446.5</u> , Ans.	<u>703861</u>
		<u>886864.86</u> , Ans.

<b>128.</b> 824.84	<b>129.</b> \$62.005	<b>130.</b> \$47.168
424	91	208
<u>329936</u>	<u>62005</u>	<u>377344</u>
164968	558045	94336
<u>329936</u>	<u>\$5642.455</u> , Ans.	<u>\$9810.944</u> , Ans.
<u>349732.16</u> , Ans.		

<b>131.</b> \$617.43	<b>132.</b> 5634	<b>133.</b> 965.13
355	47	3705
<u>308715</u>	<u>39438</u>	<u>482565</u>
308715	22536	675591
185229	Ans. <u>264798</u> bu.	289539
<u>\$219187.65</u> , Ans.		<u>3575806.65</u> , Ans.

**135.** 473970.

**136.** 7854000; 138000.

### Article 61.

<b>138.</b> 814000.	<b>142.</b> \$67244.10.	<b>146.</b> 27306000.
<b>139.</b> 274470.	<b>143.</b> 2760720.	<b>147.</b> \$23364000.
<b>140.</b> 493020.	<b>144.</b> \$3208100.	<b>148.</b> 16320000 mi.
<b>141.</b> 603900.	<b>145.</b> 2051636.8.	<b>149.</b> 4992000 acres.

## MISCELLANEOUS EXERCISES.

150.		151.
\$ 19.50		416
8		3
<u>\$ 156.00</u> , cost of feed.		<u>1248</u> , wounded.
170.00 " flour.		416
63.25 " oats.		<u>1664</u> , total loss of army.
<u>\$ 389.25</u>		5
\$ 8.50	\$ 500	<u>8320</u> , enemy's loss.
20	389.25	1664
<u>\$ 170.00</u> , cost of flour.	<u>\$ 110.75</u> , Ans.	<u>9984</u> , Ans.

152.		
\$ 4.25		\$ 1.30
52		52
<u>850</u>		<u>260</u>
2125		650
<u>\$ 221.00</u> , cost of board.		<u>\$ 67.60</u> , cost of cigars, etc.
\$ 221.00, board.	\$ 1500.00	
150.00, expenses.	438.60	
67.60, cigars, etc.	<u>\$ 1061.40</u> , saved.	
<u>\$ 438.60</u> , spent.	67.60	
Ans. <u>\$ 1129.00</u> , what he could have saved		

153.	154.
31.50	1360
16.25	120
<u>15.25</u> mi. apart in 1 hour.	<u>27200</u>
48	1360
<u>12200</u>	Ans. <u>163200</u> lb.
6100	
Ans. <u>732.00</u> mi. apart in 48 hours.	

## 155.

56	85
29	29
<u>27 girls.</u>	<u>765</u>
79	170
<u>243</u>	<u>2465 lb., weight of boys.</u>
189	2133
<u>2133 lb., weight of girls.</u>	Ans. <u>4598 lb.</u>

## 156.

\$ 3.75	\$ 573.95
130	<u>487.50</u>
<u>11250</u>	Ans. \$ 86.45, gain.
375	
<u>\$ 487.50, cost of cloth.</u>	

## 157.

842	842
<u>796</u>	<u>796</u>
46, dif.	<u>1638</u>
2	92
<u>92</u>	<u>3276</u>
	14742
	<u>150696, Ans.</u>

## 158.

\$ 31.50	\$ 4.25
40	22
<u>\$ 1260.00</u>	<u>850</u>
	850
	<u>\$ 93.50</u>
\$ 1260.00, cost of boards.	
93.50 " shingles.	
<u>\$ 1353.50, Ans.</u>	

## 159.

\$ 2500	\$ 75
1900	60
<u>\$ 4400</u>	<u>\$ 4500, cost of land.</u>
\$ 4500	
<u>4400</u>	
\$ 100, Ans.	

## 160.

\$ 2.75	\$ 1.80
17	114
<u>1925</u>	<u>720</u>
275	180
\$ 46.75	180
	<u>\$ 205.20</u>

\$ 46.75, cost of silk.

205.20 " carpet.

17.00 " lining.

\$ 268.95, Ans.

## 161.

\$ 50	\$ 4.25
60	120
<u>\$ 3000</u>	<u>8500</u>
	425
\$ 50	<u>\$ 510.00</u>
20	
<u>\$ 1000</u> , ret.	

\$ 45.50 \$ 125

28 5

36400 \$ 625

9100

\$ 1274.00, cost of cows.

3000 " oxen.

510 " sheep.

625 " horses

\$ 5409

• 1000

\$ 4409, Ans.

162. 325 \$ 1.65

24 1.48

1300 .17, gain on 1 bu.

650

7800 bu.

.17

54600

7800

Ans. \$ 1326.00, gain.

## Article 71.

36. 383.	41. 12.23.	47. 612 $\frac{3}{4}$ .	52. 4.348 $\frac{1}{2}$ .
37. 821.	42. 11.90.	48. 8423 $\frac{1}{2}$ .	53. 405.
38. 971.	43. 4.467.	49. 673 $\frac{1}{2}$ .	54. 205 $\frac{3}{4}$ mi.
39. 1142.	45. 715 $\frac{1}{2}$ .	50. 13.34.	55. \$ 5.45.
40. 58.6.	46. 678 $\frac{1}{2}$ .	51. 60.71 $\frac{1}{2}$ .	56. 2313 $\frac{1}{2}$ .

## Article 72

69. 470 $\frac{1}{2}$ .	71. 1359 $\frac{1}{2}$ .	73. 1.063.
70. 234.	72. 5.63.	74. 50.5.

**Article 74.****76.** \$ 3.18, Ans.**77.** \$ 32.02, Ans.**78.**990~~333~~, Ans.

$$\begin{array}{r}
 351 \ ) \ 347692 \\
 \underline{3159} \phantom{00} \\
 3179 \phantom{00} \\
 \underline{3159} \phantom{00} \\
 202
 \end{array}$$

**79.**10.67~~783~~, Ans.

$$\begin{array}{r}
 793 \ ) \ 8468.31 \\
 \underline{793} \phantom{00} \\
 5383 \phantom{00} \\
 \underline{4758} \phantom{00} \\
 6251 \phantom{00} \\
 \underline{5551} \phantom{00} \\
 700
 \end{array}$$

**80.**965~~987~~, Ans.

$$\begin{array}{r}
 982 \ ) \ 947684 \\
 \underline{8838} \phantom{00} \\
 6388 \phantom{00} \\
 \underline{5892} \phantom{00} \\
 4964 \phantom{00} \\
 \underline{4910} \phantom{00} \\
 54
 \end{array}$$

**81.**4.47~~783~~, Ans.

$$\begin{array}{r}
 735 \ ) \ 3287.64 \\
 \underline{2940} \phantom{00} \\
 3476 \phantom{00} \\
 \underline{2940} \phantom{00} \\
 5364 \phantom{00} \\
 \underline{5145} \phantom{00} \\
 219
 \end{array}$$

**82.**5.509~~134~~, Ans.

$$\begin{array}{r}
 1234 \ ) \ 6798.341 \\
 \underline{6170} \phantom{00} \\
 6283 \phantom{00} \\
 \underline{6170} \phantom{00} \\
 11341 \phantom{00} \\
 \underline{11106} \phantom{00} \\
 235
 \end{array}$$

**83.**\$ 8.503~~887~~, Ans.

$$\begin{array}{r}
 987 \ ) \ \$ \ 8392.476 \\
 \underline{7896} \phantom{00} \\
 4964 \phantom{00} \\
 \underline{4935} \phantom{00} \\
 2976 \phantom{00} \\
 \underline{2961} \phantom{00} \\
 15
 \end{array}$$

84.

505~~4949~~, Ans.

$$\begin{array}{r}
 5942 \overline{) 3004760} \\
 \underline{29710} \phantom{0} \\
 33760 \\
 \underline{29710} \phantom{0} \\
 4050
 \end{array}$$

85.

1487~~813~~, Ans.

$$\begin{array}{r}
 873 \overline{) 1298763} \\
 \underline{873} \phantom{00} \\
 4257 \\
 \underline{3492} \phantom{0} \\
 7656 \\
 \underline{6984} \phantom{0} \\
 6723 \\
 \underline{6111} \phantom{0} \\
 612
 \end{array}$$

86.

75~~314~~, Ans.

$$\begin{array}{r}
 841 \overline{) 63450} \\
 \underline{5887} \phantom{0} \\
 4580 \\
 \underline{4205} \phantom{0} \\
 375
 \end{array}$$

87.

2.056~~798~~, Ans.

$$\begin{array}{r}
 2007 \overline{) 4127.098} \\
 \underline{4014} \phantom{00} \\
 11309 \\
 \underline{10035} \phantom{00} \\
 12748 \\
 \underline{12042} \phantom{00} \\
 706
 \end{array}$$

89.

$$643 \times 857 = 551051$$

88.

8.75~~624~~, Ans.

$$\begin{array}{r}
 987 \overline{) 8643.21} \\
 \underline{7896} \phantom{00} \\
 7472 \phantom{00} \\
 \underline{6909} \phantom{00} \\
 5631 \\
 \underline{4935} \phantom{00} \\
 696
 \end{array}$$

1208~~123~~, Ans.

$$\begin{array}{r}
 456 \overline{) 551051} \\
 \underline{456} \phantom{00} \\
 950 \\
 \underline{912} \phantom{00} \\
 3851 \\
 \underline{3648} \phantom{00} \\
 203
 \end{array}$$

90.  $984 \times 895 = 880680.$

2453 $\frac{22}{33}$ , Ans.

359 ) 880680

$$\begin{array}{r}
 718 \\
 \hline
 1626 \\
 1436 \\
 \hline
 1908 \\
 1795 \\
 \hline
 1130 \\
 1077 \\
 \hline
 53
 \end{array}$$

91.  $8964 \times 73 = 654372.$

6888 $\frac{12}{33}$ , Ans.

95 ) 654372

$$\begin{array}{r}
 570 \\
 \hline
 843 \\
 760 \\
 \hline
 837 \\
 760 \\
 \hline
 772 \\
 760 \\
 \hline
 12
 \end{array}$$

92. \$125, Ans.

85 ) \$10625

$$\begin{array}{r}
 85 \\
 \hline
 212 \\
 170 \\
 \hline
 425 \\
 425 \\
 \hline
 \end{array}$$

93. 24, Ans.

\$225 ) \$5400

$$\begin{array}{r}
 450 \\
 \hline
 900 \\
 900 \\
 \hline
 \end{array}$$

94. \$6848.76 $\frac{2}{3}$ , Ans.

98 ) \$671178.90

$$\begin{array}{r}
 588 \\
 \hline
 831 \\
 784 \\
 \hline
 477 \\
 392 \\
 \hline
 858 \\
 784 \\
 \hline
 749 \\
 686 \\
 \hline
 630 \\
 588 \\
 \hline
 42
 \end{array}$$

95. 26 $\frac{10}{11}$ , Ans.

115 ) 3000

$$\begin{array}{r}
 230 \\
 \hline
 700 \\
 690 \\
 \hline
 10
 \end{array}$$

96. 3.44 $\frac{24}{11}$ , Ans.

512 ) 1763.68

$$\begin{array}{r}
 1536 \\
 \hline
 2276 \\
 2048 \\
 \hline
 2288 \\
 2048 \\
 \hline
 240
 \end{array}$$

97.

3007, Ans.

$$2135 \overline{) 6419945}$$

$$\underline{6405}$$

$$14945$$

$$\underline{14945}$$

98.

114<sup>52</sup><sub>433</sub>, Ans.

$$432 \overline{) 49300}$$

$$\underline{432}$$

$$610$$

$$\underline{432}$$

$$1780$$

$$\underline{1728}$$

$$52$$

99.

342, Ans.

$$2047 \overline{) 700074}$$

$$\underline{6141}$$

$$8597$$

$$\underline{8188}$$

$$4094$$

$$\underline{4094}$$

100.

\$ 52.88, Ans.

$$108 \overline{) \$ 5711.04}$$

$$\underline{540}$$

$$311$$

$$\underline{216}$$

$$950$$

$$\underline{864}$$

$$864$$

$$\underline{864}$$

101.

\$ 136<sup>340</sup><sub>388</sub>, Ans.

$$365 \overline{) \$ 50000}$$

$$\underline{365}$$

$$1350$$

$$\underline{1095}$$

$$2550$$

$$\underline{2190}$$

$$360$$

103.

61.87<sup>22</sup><sub>44</sub>, Ans.

$$44 \overline{) 2722.50}$$

$$\underline{264}$$

$$82$$

$$\underline{44}$$

$$385$$

$$\underline{352}$$

$$330$$

$$\underline{308}$$

$$22$$



**104.**

$$\begin{array}{r}
 106.558\overline{12}, \text{ Ans.} \\
 86 \overline{) 9164.000} \\
 \underline{86} \phantom{000} \\
 564 \phantom{00} \\
 \underline{516} \phantom{00} \\
 480 \phantom{00} \\
 \underline{430} \phantom{00} \\
 500 \phantom{00} \\
 \underline{430} \phantom{00} \\
 700 \phantom{00} \\
 \underline{688} \phantom{00} \\
 12
 \end{array}$$

**105.**

$$\begin{array}{r}
 \$ 31.25, \text{ Ans.} \\
 404 \overline{) \$ 12625.00} \\
 \underline{1212} \phantom{00} \\
 505 \phantom{00} \\
 \underline{404} \phantom{00} \\
 1010 \phantom{00} \\
 \underline{808} \phantom{00} \\
 2020 \phantom{00} \\
 \underline{2020}
 \end{array}$$

**106.**

$$\begin{array}{r}
 137.125, \text{ Ans.} \\
 128 \overline{) 17552.000} \\
 \underline{128} \phantom{000} \\
 475 \phantom{00} \\
 \underline{384} \phantom{00} \\
 912 \phantom{00} \\
 \underline{896} \phantom{00} \\
 160 \phantom{00} \\
 \underline{128} \phantom{00} \\
 320 \phantom{00} \\
 \underline{256} \phantom{00} \\
 640 \phantom{00} \\
 \underline{640}
 \end{array}$$

**107.**

$$\begin{array}{r}
 30303\overline{13}, \text{ Ans.} \\
 33 \overline{) 1000000} \\
 \underline{99} \phantom{000} \\
 100 \phantom{00} \\
 \underline{99} \phantom{00} \\
 100 \phantom{00} \\
 \underline{99} \phantom{00} \\
 1
 \end{array}$$

**Article 75.****110.** \$ 19.65.**112.** 45.54.**111.** 39.62 ; 3.962.**113.** 137 $\frac{4}{5}$ .

114. 1090.181~~1100~~, Ans.

54.00 ) 58869.90

$$\begin{array}{r}
 54 \\
 \hline
 486 \\
 486 \\
 \hline
 99 \\
 54 \\
 \hline
 450 \\
 432 \\
 \hline
 18
 \end{array}$$

115.

28.222~~2~~, Ans.

$$\begin{array}{r}
 51|000) 1437|272 \\
 \hline
 102 \\
 \hline
 417 \\
 \hline
 408 \\
 \hline
 9272
 \end{array}$$

116.

49411~~11000~~ sec., Ans.

186|000 ) 92000|000

$$\begin{array}{r}
 744 \\
 \hline
 1760 \\
 1674 \\
 \hline
 860 \\
 744 \\
 \hline
 116000
 \end{array}$$

117.

1024~~4400~~, Ans.

8291 ) 8496453

$$\begin{array}{r}
 8291 \\
 \hline
 20545 \\
 \hline
 16582 \\
 \hline
 39633 \\
 \hline
 33164 \\
 \hline
 6469
 \end{array}$$

119.

58881~~148~~, Ans.

1234 ) 72659302

$$\begin{array}{r}
 6170 \\
 \hline
 10959 \\
 \hline
 9872 \\
 \hline
 10873 \\
 \hline
 9872 \\
 \hline
 10010 \\
 \hline
 9872 \\
 \hline
 1382 \\
 \hline
 1234 \\
 \hline
 148
 \end{array}$$

118.

7683~~978~~, Ans.

3782 ) 2907654

$$\begin{array}{r}
 26474 \\
 \hline
 26025 \\
 \hline
 22692 \\
 \hline
 33334 \\
 \hline
 30256 \\
 \hline
 3078
 \end{array}$$

**120.**11956~~3344~~, Ans.

5678 ) 67890123

$$\begin{array}{r}
 5678 \\
 \hline
 11110 \\
 5678 \\
 \hline
 54321 \\
 51102 \\
 \hline
 32192 \\
 28390 \\
 \hline
 38023 \\
 34068 \\
 \hline
 3955
 \end{array}$$

**121.**1.542~~3333~~, Ans.

2961 ) 4567.890

$$\begin{array}{r}
 2961 \\
 \hline
 16068 \\
 14805 \\
 \hline
 12639 \\
 11844 \\
 \hline
 7950 \\
 5922 \\
 \hline
 2028
 \end{array}$$

**122.**.529~~316~~, Ans.

349 ) 184.837

$$\begin{array}{r}
 1745 \\
 \hline
 1033 \\
 698 \\
 \hline
 3357 \\
 3141 \\
 \hline
 216
 \end{array}$$

**123.**9771~~898~~, Ans.

6384 ) 6239076

$$\begin{array}{r}
 57456 \\
 \hline
 49347 \\
 44688 \\
 \hline
 46596 \\
 44688 \\
 \hline
 1908
 \end{array}$$

**124.**1.788~~123~~, Ans.

945 ) 1689.783

$$\begin{array}{r}
 945 \\
 \hline
 7447 \\
 6615 \\
 \hline
 8328 \\
 7560 \\
 \hline
 7683 \\
 7560 \\
 \hline
 123
 \end{array}$$

**125.**

849 × 863 = 732687.

585~~367~~, Ans.

1252 ) 732687

$$\begin{array}{r}
 6260 \\
 \hline
 10668 \\
 10016 \\
 \hline
 6527 \\
 6260 \\
 \hline
 267
 \end{array}$$

**126.**

$$84 \times 96 \times 25 = 201600$$

$$169 \frac{452}{1183}, \text{ Ans.}$$

$$\begin{array}{r} 1189 \overline{) 201600} \\ \underline{1189} \phantom{00} \\ 8270 \phantom{00} \\ \underline{7134} \phantom{00} \\ 11360 \phantom{00} \\ \underline{10701} \phantom{00} \\ 659 \phantom{00} \end{array}$$

**127.**

$$694 \times 87 + 956 = 61334$$

$$100 \frac{434}{883}, \text{ Ans.}$$

$$\begin{array}{r} 609 \overline{) 61334} \\ \underline{609} \phantom{00} \\ 434 \phantom{00} \end{array}$$

**129.**

$$9008 \times 7080 = 63776640$$

$$30515 \frac{220}{2080}, \text{ Ans.}$$

$$\begin{array}{r} 209 \overline{) 63776640} \\ \underline{627} \phantom{00} \\ 1076 \phantom{00} \\ \underline{1045} \phantom{00} \\ 316 \phantom{00} \\ \underline{209} \phantom{00} \\ 1074 \phantom{00} \\ \underline{1045} \phantom{00} \\ 290 \phantom{00} \end{array}$$

**128.**

$$847 \times 12 \times 900 = 9147600$$

$$\begin{array}{r} 9 \overline{) 9147600} \\ \underline{1016400}, \text{ Ans.} \end{array}$$

**130.**

$$\$ 1.11 \frac{115}{888}, \text{ Ans.}$$

$$\begin{array}{r} 850 \overline{) \$ 945.65} \\ \underline{850} \phantom{00} \\ 956 \phantom{00} \\ \underline{850} \phantom{00} \\ 1065 \phantom{00} \\ \underline{850} \phantom{00} \\ 215 \phantom{00} \end{array}$$

**131.**

$$843 - 159 = 684$$

$$29 \times 7 = 203$$

$$\begin{array}{r} 203 \overline{) 684} \left( 3 \frac{75}{203}, \text{ Ans.} \right. \\ \underline{609} \phantom{00} \\ 75 \phantom{00} \end{array}$$

**132.**

$$\$ .871 \frac{100}{1178}, \text{ Ans.}$$

$$\begin{array}{r} 975 \overline{) \$ 849.625} \\ \underline{7800} \phantom{00} \\ 6962 \phantom{00} \\ \underline{6825} \phantom{00} \\ 1375 \phantom{00} \\ \underline{975} \phantom{00} \\ 400 \phantom{00} \end{array}$$

## MISCELLANEOUS EXERCISES.

$$133. \quad \$3) \$7665 \\ \underline{2555} \text{ bbl., Ans.}$$

$$134. \quad 25 \\ 31 \\ \underline{56} \text{ miles apart in 1 day.}$$

101 days, Ans.

$$56) 5656$$

$$\underline{56}$$

$$56$$

$$\underline{56}$$

$$135. \quad \begin{array}{r} 2240 \\ 2000 \\ \hline 240 \end{array} \quad \begin{array}{r} 240 \\ 25 \\ \hline 1200 \end{array}$$

$$2000) 6000 \\ \underline{3} \text{ short tons, Ans.}$$

$$\begin{array}{r} 480 \\ \hline 6000 \text{ lb., gain.} \end{array}$$

136.

$$\begin{array}{r} \$34 \\ 75 \\ \hline 170 \\ 238 \\ \hline \$2550 \end{array} \quad \begin{array}{r} \$20.40 \\ 85 \\ \hline 10200 \\ 16320 \\ \hline \$1734.00 \end{array} \quad \begin{array}{r} \$1734 \\ 75 \\ 2550 \\ \hline \$4284 \end{array} \quad \begin{array}{r} 85 \\ 160) \\ \hline \$4284.00 \end{array} \quad \begin{array}{r} \$26.77 \frac{80}{100}, \text{ Ans.} \\ 320 \\ \hline 1084 \\ 960 \\ \hline 1240 \\ 1120 \\ \hline 1200 \\ 1120 \\ \hline 80 \end{array}$$

$$137. \quad \begin{array}{r} \$15 \\ 12 \\ 30 \\ 15 \\ \hline \$180 \end{array} \quad \begin{array}{r} \$180) \$2520 \\ 180 \\ \hline 720 \\ 720 \\ \hline \end{array} \quad 14, \text{ Ans.}$$

$$138. \quad \begin{array}{r} 640, \text{ Ans.} \\ 15|0) 9600|0 \\ 90 \\ \hline 60 \\ 60 \\ \hline \end{array}$$

- 139.**  $\$3286 \quad \$6 \overline{) \$636}$   
 $\underline{2650}$  106, Ans.  
 $\$636$ , gain.
- 140.**  $15 \quad 525 \overline{) 33600}$   
 $\underline{35}$  3150  
 $\underline{75}$  2100  
 $\underline{45}$  2100  
 $\underline{525}$
- 141.** 35 States, Ans.  $78 \overline{) 00} \quad 2744 \overline{) 00}$   
 $\underline{234}$   
 $\underline{404}$   
 $\underline{390}$   
 1400 sq. mi. over.
- 142.** 750, Ans.  $35 \overline{) 0} \quad 26250 \overline{) 0}$   
 $\underline{245}$   
 $\underline{175}$   
 $\underline{175}$
- 143.** 56 acres.  $\$8 \overline{) 0} \quad \$448 \overline{) 0}$   
 $\underline{40}$  164  
 $\underline{48}$  56  
 $\underline{48}$  108, Ans.
- 144.** 71, Ans.  $1002 \overline{) 71142}$   
 $\underline{7014}$   
 $\underline{1002}$   
 $\underline{1002}$
- 145.**  
 $159 \quad \$795 \quad \$3 \overline{) \$651}$   
 $\underline{\$5}$  144  
 $\$795$ , cost of wood.  $\underline{\$651}$  217 sheep, Ans.

**Article 76.**

- 33.** 55405 **34.** 74760 **35.** 5496  
 $\underline{52198}$  34943  $\underline{4004}$   
 3207, Ans. 39817, Ans. 1492, Ans.
- 36.**  $\$2560.75 \quad \$5000.00$  **37.** 664  
 $\underline{375.87}$  2936.62 19  
 $\underline{\$2936.62}$   $\underline{\$2063.38}$ , Ans.  $\underline{5976}$   
 664  
 12616, Ans.

**38.**

$$\begin{array}{r}
 \$7896.84 \\
 5670.00 \\
 \hline
 \$2226.84, \text{ gain.}
 \end{array}$$

$$\begin{array}{r}
 6) \$2226.84 \\
 \hline
 \$371.14, \text{ Ans.}
 \end{array}$$

**39.**

$$\begin{array}{r}
 \$0.11 \\
 0.09 \\
 \hline
 \$0.02, \text{ gain on 1 lb.}
 \end{array}
 \qquad
 \begin{array}{r}
 255 \\
 3 \\
 \hline
 765 \text{ lb.} \\
 \$0.02 \\
 \hline
 \$15.30, \text{ Ans.}
 \end{array}$$

**40.**

$$\begin{array}{r}
 223 \\
 61 \\
 \hline
 162 \text{ miles.}
 \end{array}$$

$$\begin{array}{r}
 6 \text{ days, Ans.} \\
 27) 162 \\
 \hline
 162
 \end{array}$$

**41.**

$$\begin{array}{r}
 \$97 \\
 365 \\
 \hline
 485 \\
 582 \\
 291 \\
 \hline
 \$35405, \text{ Ans.}
 \end{array}$$

**42.**

$$\begin{array}{r}
 596 \\
 48 \\
 \hline
 4768 \\
 2384 \\
 \hline
 28608 \\
 10 \\
 \hline
 28618, \text{ Ans.}
 \end{array}$$

**43.**

$$\begin{array}{r}
 \$0.15 \\
 17 \\
 \hline
 105 \\
 15 \\
 \hline
 \$2.55
 \end{array}
 \qquad
 \begin{array}{r}
 \$0.28 \\
 46 \\
 \hline
 168 \\
 112 \\
 \hline
 \$12.88
 \end{array}
 \qquad
 \begin{array}{r}
 \$0.76 \\
 16 \\
 \hline
 456 \\
 76 \\
 \hline
 \$12.16
 \end{array}
 \qquad
 \begin{array}{r}
 \$2.55 \\
 12.88 \\
 \hline
 12.16 \\
 \$27.59
 \end{array}$$

**\$0.14, Ans.**

$$\begin{array}{r}
 \$42.57 \\
 27.59 \\
 \hline
 \$14.98
 \end{array}$$

$$\begin{array}{r}
 107) \$14.98 \\
 107 \\
 \hline
 428 \\
 428 \\
 \hline
 \hline
 \end{array}$$

**44.**

$$\begin{array}{r}
 \$1549.60 \\
 1472.50 \\
 \hline
 \$77.10, \text{ gain.}
 \end{array}$$

**\$0.24378, Ans.**

$$\begin{array}{r}
 310) \$77.10 \\
 620 \\
 \hline
 1510 \\
 1240 \\
 \hline
 270
 \end{array}$$

				45.	\$4.71 $\frac{1}{2}$ $\frac{3}{8}$ , Ans.
\$12	\$15	144	\$18	252)	\$1188.00
144	108	108	252		1008
<u>48</u>	<u>120</u>	252 acres.	<u>36</u>		<u>1800</u>
48	15		90		1764
12	\$1620		36		360
\$1728	1728		\$4536		252
	\$3348, cost.		3348		<u>108</u>
			\$1188, gain.		

46.		47.		
27, Ans.		\$ 8, Ans.		
407)	10989	\$ 1728	288)	\$ 2304
	814	576		<u>2304</u>
	<u>2849</u>	\$ 2304, sold for.		
	2849			

48.		
\$5100	\$2013	\$5815.80
715.80	1981.95	3994.95
<u>\$5815.80</u>	<u>\$3994.95, paid.</u>	<u>\$1820.85, Ans.</u>

49.  $194 + 65 = 259$ ;  $259 \times 7 = 1813$ .

$$\frac{352 - 220}{11} = \frac{132}{11} = 12,$$

$1813 + 12 = 1825$ ;  $1825 - 952 = 873$ , Ans.

50.			
\$5.75	\$9.25	\$21.50	\$2875.00, cost of flour.
500	47	15	434.75, " cheese.
\$2875.00	6475	10750	322.50, " pork.
	3700	2150	\$3632.25, Ans.
	<u>\$434.75</u>	<u>\$322.50</u>	



51.

\$9212 1375 hhd., Ans.

20 \$67) \$9232

\$9232 67253

201

522

469

53

52.

2240 13880, Ans.

2000 2240) 30000

240 lb. 22407600

125

67202408805000250

Gain, 30000 lb.

53. 19 horses, Ans.

\$150 ) \$2973

1501473

1350

Ans. \$123 for the carriage.

54.

 $\frac{7781}{31} = 251.$  $251 + 549 = 800.$  $(2128 \div 7) \times 2 = 608.$  $800 - 608 = 192, \text{ Ans.}$ 

55.

 $194 + 65 = 259; 259 \times 7 = 1813.$  $352 - 220 = 132; 132 \div 11 = 12.$  $1813 + 12 = 1825.$  $91 - 35 = 56.$  $952 \div 56 = 17.$  $1825 - 17 = 1808, \text{ Ans.}$ 

56.

\$63

\$45.50

125360315273000

126

13650

63

\$16380.00\$787592431368\$7137, \text{ Ans.}\$9243

57. 17, Ans.

150 24|00) 408|00

16249001681501682400

58.

18988

1318975

759, Ans.

25 ) 18975

175147125225225

59.

$$\begin{array}{r}
 320 \quad 5280 \quad 550, \text{ Ans.} \\
 160 \quad 100 \quad 96|0) 52800|0 \\
 \hline
 480 \quad 528000 \text{ ft.} \quad 480 \\
 2 \quad \hline
 960 \text{ ft.} \quad 480 \\
 \hline
 \end{array}$$

60.  $\$37 + \$51 = \$88$ .

$$\begin{array}{r}
 17, \text{ Ans.} \\
 \$88) \$1496 \\
 \hline
 88 \\
 616 \\
 \hline
 616
 \end{array}$$

61.

$$\begin{array}{r}
 \$520 \quad \$520 \\
 216) \$112320 \quad 519 \\
 \hline
 1080 \quad 4680 \\
 \hline
 432 \quad 520 \\
 \hline
 432 \quad 2600 \\
 \hline
 \$269880, \text{ Ans.}
 \end{array}$$

62.

$$\begin{array}{r}
 1160 \quad 11 \text{ 60 lb., Ans.} \\
 2 \quad \$ .38) \$440.80 \\
 \hline
 2320 \quad 38 \\
 \hline
 \$ .19 \quad 60 \\
 \hline
 20880 \quad 38 \\
 \hline
 2320 \quad 228 \\
 \hline
 \$440.80 \quad 228 \\
 \hline
 \end{array}$$

63.

$$\begin{array}{r}
 \$11 \quad \$155 \quad \$5 \quad \$165, \text{ cost of hay.} \quad \$3038 \quad 13, \text{ Ans.} \\
 15 \quad 3 \quad 375 \quad 465, \quad \text{" oxen.} \quad 2505 \quad \$41) \$533 \\
 \hline
 55 \quad \$465 \quad 25 \quad 1875, \quad \text{" sheep.} \quad \$533 \quad 41 \\
 11 \quad 35 \quad \$2505 \quad 123 \\
 \hline
 \$165 \quad 15 \quad 123 \\
 \hline
 \$1875
 \end{array}$$

64.

$$\begin{array}{r}
 \$7600 \quad \$3775 \quad \$15200 \quad 2 \quad 6) \$34902 \\
 2 \quad 3 \quad 11325 \quad 1 \quad \hline
 \$15200 \quad \$11325 \quad 1500 \quad 3 \quad \$5817, \text{ Ans.} \\
 \hline
 6877 \quad 6 \text{ heirs.} \\
 \hline
 \$34902
 \end{array}$$

65.

$$\begin{array}{r}
 \$2.40 \\
 17 \\
 \hline
 1680 \\
 240 \\
 \hline
 \$40.80
 \end{array}
 \quad
 9 \overline{) \$40.80}$$

 $\$4.53\frac{1}{3}, \text{ Ans.}$ 

66.

$$\begin{array}{r}
 160 \quad \$965 \quad \$3 \overline{) \$165} \\
 \$5 \quad 800 \quad 55 \text{ tons.} \\
 \hline
 \$800 \quad \$165
 \end{array}$$

$$\begin{array}{r}
 160 \\
 55 \\
 \hline
 \text{Ans. } 215 \text{ tons.}
 \end{array}$$

67.

$$\begin{array}{r}
 5 \overline{) 960} \quad 3 \overline{) 960} \quad 192 \quad 960 \quad \$2304 \\
 \underline{192} \quad \underline{320} \quad \underline{320} \quad \underline{512} \quad 4800 \\
 \$12 \quad \$15 \quad \underline{512} \text{ acres.} \quad \underline{448} \quad 8960 \\
 \underline{384} \quad \underline{1600} \quad \$20 \quad \underline{\$16064}, \text{ sold for.} \\
 192 \quad 320 \quad \underline{\$8960} \quad 12000, \text{ cost.} \\
 \$2304 \quad \$4800 \quad \text{Ans. } \$4064, \text{ gain.}
 \end{array}$$

## Article 82.

8.

$$\begin{array}{r}
 2 \overline{) 84} \quad 2 \overline{) 144} \quad 2 \overline{) 160} \\
 \underline{2 \overline{) 42}} \quad \underline{2 \overline{) 72}} \quad \underline{2 \overline{) 80}} \\
 3 \overline{) 21} \quad 2 \overline{) 36} \quad 2 \overline{) 40} \\
 \underline{7} \quad \underline{2 \overline{) 18}} \quad \underline{2 \overline{) 20}} \\
 \quad \underline{3 \overline{) 9}} \quad \underline{2 \overline{) 10}} \\
 \quad \quad 3 \quad \quad 5
 \end{array}$$

 $2^3, 3, 7. \quad 2^4, 3^2. \quad 2^5, 5, \text{ Ans.}$ 

9.

$$\begin{array}{r}
 2 \overline{) 462} \quad 2 \overline{) 576} \quad 2 \overline{) 1008} \\
 \underline{3 \overline{) 231}} \quad \underline{2 \overline{) 288}} \quad \underline{2 \overline{) 504}} \\
 7 \overline{) 77} \quad 2 \overline{) 144} \quad 2 \overline{) 252} \\
 \underline{11} \quad \underline{2 \overline{) 72}} \quad \underline{2 \overline{) 126}} \\
 \quad \underline{2 \overline{) 36}} \quad \underline{3 \overline{) 63}} \\
 \quad \underline{2 \overline{) 18}} \quad \underline{3 \overline{) 21}} \\
 \quad \underline{3 \overline{) 9}} \quad \underline{7} \\
 \quad \quad 3
 \end{array}$$

 $\text{Ans. } 2, 3, 7, 11. \quad 2^6, 3^2. \quad 2^4, 3^2, 7.$

**Article 83.**

$$\begin{array}{r} 10. \quad 2 \overline{) 210} \\ \quad 3 \overline{) 105} \\ \quad \quad 5 \overline{) 35} \\ \quad \quad \quad 7 \end{array}$$

2, 3, 5, 7, Ans.

$$\begin{array}{r} 11. \quad 2 \overline{) 2772} \\ \quad 2 \overline{) 1386} \\ \quad \quad 3 \overline{) 693} \\ \quad \quad \quad 3 \overline{) 231} \\ \quad \quad \quad \quad 7 \overline{) 77} \\ \quad \quad \quad \quad \quad 11 \end{array}$$

2<sup>2</sup>, 3<sup>2</sup>, 7, 11, Ans.

$$\begin{array}{r} 12. \quad 2 \overline{) 426} \\ \quad 3 \overline{) 213} \\ \quad \quad 71 \end{array}$$

2, 3, 71, Ans.

$$\begin{array}{r} 13. \quad 3 \overline{) 6105} \\ \quad 5 \overline{) 2035} \\ \quad \quad 11 \overline{) 407} \\ \quad \quad \quad 37 \end{array}$$

3, 5, 11, 37, Ans.

$$\begin{array}{r} 14. \quad 3 \overline{) 1155} \\ \quad 5 \overline{) 385} \\ \quad \quad 11 \overline{) 77} \\ \quad \quad \quad 7 \end{array}$$

3, 5, 7, 11, Ans.

$$\begin{array}{r} 15. \quad 2 \overline{) 2800} \\ \quad 2 \overline{) 1400} \\ \quad \quad 2 \overline{) 700} \\ \quad \quad \quad 2 \overline{) 350} \\ \quad \quad \quad \quad 5 \overline{) 175} \\ \quad \quad \quad \quad \quad 5 \overline{) 35} \\ \quad \quad \quad \quad \quad \quad 7 \end{array}$$

2<sup>2</sup>, 5<sup>2</sup>, 7, Ans.

$$\begin{array}{r} 16. \quad 2 \overline{) 3420} \\ \quad 2 \overline{) 1710} \\ \quad \quad 3 \overline{) 855} \\ \quad \quad \quad 3 \overline{) 285} \\ \quad \quad \quad \quad 5 \overline{) 95} \\ \quad \quad \quad \quad \quad 19 \end{array}$$

2<sup>2</sup>, 3<sup>2</sup>, 5, 19, Ans.

$$\begin{array}{r} 17. \quad 2 \overline{) 7800} \\ \quad 2 \overline{) 3900} \\ \quad \quad 2 \overline{) 1950} \\ \quad \quad \quad 3 \overline{) 975} \\ \quad \quad \quad \quad 5 \overline{) 325} \\ \quad \quad \quad \quad \quad 5 \overline{) 65} \\ \quad \quad \quad \quad \quad \quad 13 \end{array}$$

2<sup>2</sup>, 3, 5<sup>2</sup>, 13, Ans.

$$\begin{array}{r} 18. \quad 2 \overline{) 16028} \\ \quad 2 \overline{) 8014} \\ \quad \quad 4007 \end{array}$$

2<sup>2</sup>, 4007, Ans.

$$\begin{array}{r} 19. \quad 3 \overline{) 17199} \\ \quad 3 \overline{) 5733} \\ \quad \quad 3 \overline{) 1911} \\ \quad \quad \quad 7 \overline{) 637} \\ \quad \quad \quad \quad 7 \overline{) 91} \\ \quad \quad \quad \quad \quad 13 \end{array}$$

3<sup>2</sup>, 7<sup>2</sup>, 13, Ans.

$$\begin{array}{r} 20. \quad 3 \overline{) 10323} \\ \quad 3 \overline{) 3441} \\ \quad \quad 31 \overline{) 1147} \\ \quad \quad \quad 37 \end{array}$$

3<sup>2</sup>, 31, 37, Ans.

$$\begin{array}{r} 21. \quad 2 \overline{) 12496} \\ \quad 2 \overline{) 6248} \\ \quad \quad 2 \overline{) 3124} \\ \quad \quad \quad 2 \overline{) 1562} \\ \quad \quad \quad \quad 11 \overline{) 781} \\ \quad \quad \quad \quad \quad 71 \end{array}$$

2<sup>2</sup>, 11, 71, Ans.

<b>22.</b> $2 \overline{) 1184}$	<b>23.</b> $3 \overline{) 4389}$	<b>24.</b> $2 \overline{) 6300}$	<b>25.</b> $7 \overline{) 40579}$
$2 \overline{) 592}$	$7 \overline{) 1463}$	$2 \overline{) 3150}$	$11 \overline{) 5797}$
$2 \overline{) 296}$	$11 \overline{) 209}$	$3 \overline{) 1575}$	$17 \overline{) 527}$
$2 \overline{) 148}$	19	$3 \overline{) 525}$	31
$2 \overline{) 74}$		$5 \overline{) 175}$	
37	3, 7, 11, 19, Ans.	$5 \overline{) 35}$	7, 11, 17, 31, Ans.
		7	

**37. Ans.**

**2<sup>2</sup>, 3<sup>2</sup>, 5<sup>2</sup>, 7, Ans.**

### Article 85.

$$\begin{array}{r} \text{32.} \\ \frac{\overset{5}{45} \times \overset{5}{20} \times 7}{\underset{7}{49} \times 4 \times 9} = \frac{25}{7} = 3\frac{4}{7}, \text{ Ans.} \end{array} \quad \begin{array}{r} \text{33.} \\ \frac{\overset{3}{54} \times 3 \times \overset{3}{4} \times 15}{18 \times \underset{4}{12} \times \underset{2}{10}} = \frac{9}{2} = 4\frac{1}{2}, \text{ Ans.} \end{array}$$

## Article 86.

$$\begin{array}{r} 3 \\ 51 \\ 255 \times 9 \\ 340 \times 12 \times 4 \\ 68 \\ 17 \end{array} \quad \begin{array}{c} 34. \\ \\ \\ \\ \\ \end{array} \quad \begin{array}{r} 3 \\ 18 \times 8 \times 5 \\ 12 \times 3 \times 6 \times 2 \\ 2 \end{array} \quad \begin{array}{c} 35. \\ \\ \\ \\ \\ \end{array} \quad \begin{array}{r} 9 \\ 9 = 2\frac{1}{4}, \text{ Ans.} \\ 4 \\ 25 \\ 2 \end{array} \quad \begin{array}{c} 25 \\ 12\frac{1}{2}, \text{ Ans.} \end{array}$$

$$\begin{array}{r} \text{36.} \\ \begin{array}{r} 5 \quad 4 \quad 7 \\ \cancel{50} \times \cancel{36} \times \cancel{14} \\ \cancel{5} \times \cancel{10} \times \cancel{4} \times 3 \\ \hline 6 \times 3 \end{array} = \frac{35}{9} = 3\frac{8}{9}, \text{ Ans.} \end{array} \quad \begin{array}{r} \text{37.} \\ \begin{array}{r} 109 \quad 35 \\ \cancel{545} \times \cancel{105} \times \cancel{11} \\ \cancel{55} \times \cancel{22} \times \cancel{5} \\ \hline \phantom{55} \times \phantom{22} \times \phantom{5} \end{array} = 109, \text{ Ans.} \end{array}$$

38.  $\frac{8 \times 3}{\frac{64 \times 63}{\frac{168}{21}}} = 24$ , Ans.      39.  $\frac{4 \times 3 \times 7}{\frac{36 \times 21 \times 14}{\frac{27 \times 7 \times 6}{3 \times 2}}} = \frac{28}{3} = 9\frac{1}{3}$ , Ans.

30.  $\frac{4 \times \overset{7}{\cancel{42}}}{\underset{6}{\cancel{24}}} = 7$ , Ans.      41.  $\frac{\overset{5}{\cancel{120}}}{\underset{24}{\cancel{24}}} = 5$        $\frac{\overset{19}{\cancel{95}}}{\underset{5}{\cancel{5}}} = 19$ , Ans.

$$42. \frac{100 \times 12}{\frac{150}{3}} = 8, \text{ Ans.}$$

$$43. \frac{225 \times 12}{\frac{675}{3}} = 4, \text{ Ans.}$$

$$44. \frac{15 \times 30 \times 10}{\frac{3 \times 50}{5}} = \$0.30, \text{ Ans.}$$

**Article 90.**

$$50. 36 = 2 \times 2 \times 3 \times 3$$

$$81 = 3 \times 3 \times 3 \times 3$$

$$135 = 3 \times 3 \times 3 \times 5$$

$$3 \times 3 = 9, \text{ Ans.}$$

$$51. 24 = 2 \times 2 \times 2 \times 3$$

$$42 = 2 \times 3 \times 7$$

$$54 = 2 \times 3 \times 3 \times 3$$

$$60 = 2 \times 2 \times 3 \times 5$$

$$2 \times 3 = 6, \text{ Ans.}$$

**Article 91.**

$$52. 45 = 3 \times 3 \times 5$$

$$135 = 3 \times 3 \times 3 \times 5$$

$$3 \times 3 \times 5 = 45, \text{ Ans.}$$

$$53. 90 = 2 \times 3 \times 3 \times 5$$

$$105 = 3 \times 5 \times 7$$

$$3 \times 5 = 15, \text{ Ans.}$$

$$54. 42 = 2 \times 3 \times 7$$

$$81 = 3 \times 3 \times 3 \times 3$$

$$3, \text{ Ans.}$$

$$55. 132 = 2 \times 2 \times 3 \times 11$$

$$156 = 2 \times 2 \times 3 \times 13$$

$$2 \times 2 \times 3 = 12, \text{ Ans.}$$

$$56. 20 = 2 \times 2 \times 5$$

$$26 = 2 \times 13$$

$$38 = 2 \times 19$$

$$2, \text{ Ans.}$$

$$57. 32 = 2 \times 2 \times 2 \times 2 \times 2$$

$$48 = 2 \times 2 \times 2 \times 2 \times 3$$

$$128 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$$

$$2 \times 2 \times 2 \times 2 = 16, \text{ Ans.}$$

$$58. 45 = 3 \times 3 \times 5$$

$$72 = 2 \times 2 \times 2 \times 3 \times 3$$

$$81 = 3 \times 3 \times 3 \times 3$$

$$3 \times 3 = 9, \text{ Ans.}$$

$$59. 24 = 2 \times 2 \times 2 \times 3$$

$$51 = 3 \times 17$$

$$105 = 3 \times 5 \times 7$$

$$729 = 3 \times 3 \times 3 \times 3 \times 3 \times 3$$

$$3, \text{ Ans.}$$

$$60. \quad 12 = 2 \times 2 \times 3$$

$$15 = 3 \times 5$$

$$18 = 2 \times 3 \times 3$$

3 ft., Ans.

### Article 92.

62.

$$336 ) 480 ( 1 \quad 925 ) 1475 ( 1$$

$$\underline{336}$$

$$\underline{925}$$

$$144 ) 336 ( 2 \quad 550 ) 925 ( 1$$

$$\underline{288}$$

$$\underline{550}$$

$$\text{Greatest com. div.} = 48 ) 144 ( 3$$

$$375 ) 550 ( 1$$

$$\underline{144}$$

$$\underline{375}$$

$$175 ) 375 ( 2$$

$$\underline{350}$$

$$\text{Greatest common divisor} = 25 ) 175 ( 7$$

$$\underline{175}$$

64.

$$308 ) 506 ( 1$$

$$\underline{308}$$

$$198 ) 308 ( 1$$

$$\underline{198}$$

$$110 ) 198 ( 1$$

$$\underline{110}$$

$$88 ) 110 ( 1 \quad 275 ) 440 ( 1$$

$$\underline{88}$$

$$\underline{275}$$

$$\text{Greatest com. div.} = 22 ) 88 ( 4$$

$$165 ) 275 ( 1$$

$$\underline{88}$$

$$\underline{165}$$

$$110 ) 165 ( 1$$

$$\underline{110}$$

$$\text{Greatest com. div.} = 55 ) 110 ( 2$$

$$\underline{110}$$

65.

$$172 ) 1118 ( 6$$

$$\underline{1032}$$

$$\text{Greatest com. div.} = 86 ) 172 ( 2$$

$$\underline{172}$$

66.

67.

$$\begin{array}{r}
 2145 \overline{) 3471} (1 \\
 \underline{2145} \\
 1326 \overline{) 2145} (1 \\
 \underline{1326} \\
 819 \overline{) 1326} (1 \\
 \underline{819} \\
 507 \overline{) 819} (1 \\
 \underline{507} \\
 312 \overline{) 507} (1 \\
 \underline{312} \\
 195 \overline{) 312} (1 \\
 \underline{195} \\
 117 \overline{) 195} (1 \\
 \underline{117} \\
 78 \overline{) 117} (1 \\
 \underline{78} \\
 \text{Greatest common divisor} = \underline{39} \overline{) 78} (2 \\
 \underline{78}
 \end{array}$$

68.

$$\begin{array}{r}
 10353 \overline{) 14877} (1 \\
 \underline{10353} \\
 4524 \overline{) 10353} (2 \\
 \underline{9048} \\
 1305 \overline{) 4524} (3 \\
 \underline{3915} \\
 609 \overline{) 1305} (2 \\
 \underline{1218} \\
 \text{Gr. com. div.} = \underline{87} \overline{) 609} (7 \\
 \underline{609} \\
 118 \overline{) 232} (1 \\
 \underline{118} \\
 114 \overline{) 118} (1 \\
 \underline{114} \\
 4 \overline{) 114} (28 \\
 \underline{112} \\
 \text{Greatest common divisor} = \underline{2} \overline{) 4} (2 \\
 \underline{4}
 \end{array}$$

70.

$$\begin{array}{r}
 3528 \overline{) 4424} (1 \\
 \underline{3528} \\
 896 \overline{) 3528} (3 \\
 \underline{2688} \\
 840 \overline{) 896} (1 \\
 \underline{840} \\
 \text{Greatest com. div.} = \underline{56} \overline{) 840} (15 \\
 \underline{840} \\
 1764 \overline{) 2660} (1 \\
 \underline{1764} \\
 896 \overline{) 1764} (1 \\
 \underline{896} \\
 868 \overline{) 896} (1 \\
 \underline{868} \\
 \text{Gr. com. div.} = \underline{28} \overline{) 868} (31 \\
 \underline{868}
 \end{array}$$

71.



**72.**

$$744) 906 (1$$

$$\underline{744}$$

$$162) 744 (4$$

$$\underline{648}$$

$$96) 162 (1$$

$$\underline{96}$$

$$66) 96 (1$$

$$\underline{66}$$

$$30) 66 (2$$

$$\underline{60}$$

$$\text{Greatest common divisor} = \underline{6} ) 30 ( 5$$

$$\underline{30}$$

**73.**

$$728) 808 (1$$

$$\underline{728}$$

$$80) 728 (9$$

$$\underline{720}$$

$$\text{Greatest com. div.} = 8 ) 80 ( 10$$

$$\underline{80}$$

**74.**

$$756) 1140 (1$$

$$\underline{756}$$

$$384) 756 (1$$

$$\underline{384}$$

$$372) 384 (1$$

$$\underline{372}$$

$$\text{Gr. com. div.} = \underline{12} ) 372 ( 31$$

$$\underline{372}$$

**75.**

$$2883) 3131 (1$$

$$\underline{2883}$$

$$248) 2883 (11$$

$$\underline{2728}$$

$$155) 248 (1$$

$$\underline{155}$$

$$93) 155 (1$$

$$\underline{93}$$

$$62) 93 (1$$

$$\underline{62}$$

$$\text{Greatest common divisor} = \underline{31} ) 62 ( 2$$

$$\underline{62}$$

**76.**

$$3178) 3500 (1$$

$$\underline{3178}$$

$$322) 3178 (9$$

$$\underline{2898}$$

$$280) 322 (1$$

$$\underline{280}$$

$$42) 280 (6$$

$$\underline{252}$$

$$28) 42 (1$$

$$\underline{28}$$

$$\text{Greatest common divisor} = \underline{14} ) 28 ( 2$$

$$\underline{28}$$

**77.**

$$4872) 9048 (1$$

$$\underline{4872}$$

$$4176) 4872 (1$$

$$\underline{4176}$$

$$\text{Gr. com. div.} = 696 ) 4176 ( 6$$

$$\underline{4176}$$

**Article 96.**

**83.**  $7 = 1 \times 7$

$14 = 2 \times 7$

$15 = 3 \times 5$

$21 = 3 \times 7$

**84.**  $18 = 2 \times 3 \times 3$

$28 = 2 \times 2 \times 7$

$30 = 2 \times 3 \times 5$

$42 = 2 \times 3 \times 7$

$2 \times 3 \times 5 \times 7 = 210, \text{ Ans.} \quad 2 \times 2 \times 3 \times 3 \times 5 \times 7 = 1260, \text{ Ans.}$

**Article 97.**

**85.**  $21 = 3 \times 7$

$33 = 3 \times 11$

$56 = 2 \times 2 \times 2 \times 7$

$2 \times 2 \times 2 \times 3 \times 7 \times 11 = 1848, \text{ Ans.}$

**86.**  $63 = 3 \times 3 \times 7$

$72 = 2 \times 2 \times 2 \times 3 \times 3$

$84 = 2 \times 2 \times 3 \times 7$

$2 \times 2 \times 2 \times 3 \times 3 \times 7 = 504, \text{ Ans.}$

**87.**  $66 = 2 \times 3 \times 11$

$88 = 2 \times 2 \times 2 \times 11$

$110 = 2 \times 5 \times 11$

$2 \times 2 \times 2 \times 3 \times 5 \times 11 = 1320, \text{ Ans.}$

**88.**  $81 = 3 \times 3 \times 3 \times 3$

$63 = 3 \times 3 \times 7$

$135 = 3 \times 3 \times 3 \times 5$

$3 \times 3 \times 3 \times 3 \times 5 \times 7 = 2835, \text{ Ans.}$

**89.**  $8 = 2 \times 2 \times 2$

$18 = 2 \times 3 \times 3$

$24 = 2 \times 2 \times 2 \times 3$

$36 = 2 \times 2 \times 3 \times 3$

$2 \times 2 \times 2 \times 3 \times 3 = 72, \text{ Ans.} \quad 2 \times 2 \times 3 \times 5 \times 5 \times 7 \times 41 = 86100, \text{ Ans.}$

**90.**  $7 = 1 \times 7$

$25 = 5 \times 5$

$12 = 2 \times 2 \times 3$

$41 = 1 \times 41$

**91.**  $28 = 2 \times 2 \times 7$

$56 = 2 \times 2 \times 2 \times 7$

$100 = 2 \times 2 \times 5 \times 5$

$125 = 5 \times 5 \times 5$

$2 \times 2 \times 2 \times 5 \times 5 \times 5 \times 7 = 7000, \text{ Ans.}$

**92.**  $24 = 2 \times 2 \times 2 \times 3$

$42 = 2 \times 3 \times 7$

$54 = 2 \times 3 \times 3 \times 3$

$180 = 2 \times 2 \times 3 \times 3 \times 5$

$2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 5 \times 7 = 7560, \text{ Ans.}$

93.  $24 = 2 \times 2 \times 2 \times 3$   
 $96 = 2 \times 2 \times 2 \times 2 \times 2 \times 3$   
 $100 = 2 \times 2 \times 5 \times 5$   
 $144 = 2 \times 2 \times 2 \times 2 \times 3 \times 3$   
 $2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 5 \times 5 = 7200$ , Ans.
94.  $4 = 2 \times 2$   
 $11 = 1 \times 11$   
 $18 = 2 \times 3 \times 3$   
 $20 = 2 \times 2 \times 5$   
 $36 = 2 \times 2 \times 3 \times 3$   
 $48 = 2 \times 2 \times 2 \times 2 \times 3$
95.  $5 = 1 \times 5$   
 $35 = 5 \times 7$   
 $50 = 2 \times 5 \times 5$   
 $2 \times 5 \times 5 \times 7 = 350$ , Ans.
- $2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 5 \times 11 = 7920$ , Ans.

## MISCELLANEOUS EXERCISES.

96.  $2 \overline{) 2520}$   
 $2 \overline{) 1260}$   
 $2 \overline{) 630}$   
 $3 \overline{) 315}$   
 $3 \overline{) 105}$   
 $5 \overline{) 35}$   
 $\quad 7$
97.  $2 \overline{) 5760}$   
 $2 \overline{) 2880}$   
 $2 \overline{) 1440}$   
 $2 \overline{) 720}$   
 $2 \overline{) 360}$   
 $2 \overline{) 180}$   
 $2 \overline{) 90}$   
 $3 \overline{) 45}$   
 $3 \overline{) 15}$   
 $\quad 5$
98.  $689 \overline{) 1573} (2$   
 $\quad 1378$   
 $\quad \overline{195} \overline{) 689} (3$   
 $\quad \quad 585$   
 $\quad \quad 104 \overline{) 195} (1$   
 $\quad \quad \quad 104$   
 $\quad \quad \quad \overline{91} \overline{) 104} (1$   
 $\quad \quad \quad \quad 91$   
 $\quad \quad \quad \quad \overline{13} \overline{) 91} (7$   
 $\quad \quad \quad \quad \quad 91$   
 $\quad \quad \quad \quad \quad \underline{\quad}$
- $2^3, 3^2, 5, 7$ , Ans. Greatest common divisor = 15
- $2^7, 3^2$ , Ans.

99. 71

73

79

83

89

97

 $\overline{492}$ , Ans.

100.

$$\frac{2}{14} \times \frac{2}{15} \times \frac{3}{16} \times \frac{8}{24} \times \frac{5}{48} \times \frac{5}{60} = 80, \text{ Ans.}$$

$$\frac{2}{7} \times \frac{3}{30} \times \frac{3}{8} \times \frac{3}{8} \times \frac{3}{6} \times \frac{5}{12} \times \frac{5}{3}$$

- 101.**  $48 = 2 \times 2 \times 2 \times 2 \times 3$   
 $36 = 2 \times 2 \times 3 \times 3$   
 $72 = 2 \times 2 \times 2 \times 3 \times 3$   
 $24 = 2 \times 2 \times 2 \times 3$   
 $2 \times 2 \times 3 = 12$ , Greatest common divisor.  
 $2 \times 2 \times 2 \times 2 \times 3 \times 3 = 144$ , Least common multiple.  
 $12 \overline{) 144} ( 12$ , Ans.  
 $\underline{144}$   
**103.**  $160 = 2 \times 2 \times 2 \times 2 \times 2 \times 5$   
 $352 = 2 \times 2 \times 2 \times 2 \times 2 \times 11$   
 $992 = 2 \times 2 \times 2 \times 2 \times 2 \times 31$   
 $2 \times 2 \times 2 \times 2 \times 2 = 32$ , Greatest common divisor.  
 $2 \times 2 \times 2 \times 2 \times 2 \times 5 \times 11 \times 31 = 54560$ ,  
Least common multiple.  $\underline{1777}$ , Ans.  
 $54560$   
 $\underline{32}$   
 $54528$ , Ans.  
**104.**  $168 = 2 \times 2 \times 2 \times 3 \times 7$   
 $1008 = 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 7$   
 $\frac{2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 7}{2 \times 2 \times 2 \times 2 \times 3 \times 7} = 6$ , Ans.  
**105.**  
 $\frac{24 \times 35}{8} = 105$ , Ans.

**Article 111.**34.  $\frac{3}{8}$ .**Article 112.**

- 35.**  $\frac{3}{4}$ .      **37.**  $\frac{3}{4}$ .      **39.**  $\frac{1}{8}$ .      **41.**  $\frac{3}{4}$ .  
**36.**  $\frac{3}{4}$ .      **38.**  $\frac{1}{8}$ .      **40.**  $\frac{1}{8}$ .      **42.**  $\frac{3}{8}$ .

**Article 114.**53.  $\frac{3}{4}$ .54.  $\frac{5}{8}$ .**Article 115.**55.  $\frac{9}{10}$ .60.  $\frac{37}{40}$ .65.  $\frac{22}{135}$ .70.  $\frac{18}{87}$ .56.  $\frac{7}{19}$ .61.  $\frac{8}{9}$ .66.  $\frac{31}{44}$ .80.  $\frac{127}{111}$ .57.  $\frac{3}{38}$ .62.  $\frac{1}{2}$ .67.  $\frac{18}{11}$ .82.  $\frac{366}{13}$ .58.  $\frac{28}{118}$ .63.  $\frac{107}{117}$ .68.  $\frac{17}{17}$ .83.  $\frac{410}{110}$ .59.  $\frac{377}{361}$ .64.  $\frac{11}{11}$ .69.  $\frac{81}{499}$ .**Article 116.**84.  $\frac{1384}{1184}$ ;  $\frac{2347}{1117}$ .88.  $\frac{133}{133}$ .92.  $\frac{75}{75}$ .96.  $\frac{2147}{1147}$ .85.  $\frac{1484}{1484}$ .89.  $\frac{418}{418}$ .93.  $\frac{1000}{1000}$ .97.  $\frac{173010}{173010}$ .86.  $\frac{147}{147}$ .90.  $\frac{124}{124}$ .94.  $\frac{4861}{4861}$ .

105. 43.

87.  $\frac{1087}{1087}$ .91.  $\frac{2854}{2854}$ .95.  $\frac{8801}{2774}$ .106.  $\frac{6348}{6348}$ .**Article 117.**

107. 9.

111.  $\frac{1108}{1108}$ .115.  $\frac{11933}{11933}$ .119.  $\frac{9148}{9148}$ .108.  $\frac{272}{272}$ .112.  $\frac{15}{15}$ .116.  $\frac{412}{412}$ .120.  $\frac{100}{111}$ .109.  $\frac{169}{19}$ .113.  $\frac{717}{717}$ .117.  $\frac{9}{29}$ .121.  $\frac{95337}{95337}$ .

110. 1.

114. 128.

118.  $\frac{9017}{9017}$ .**Article 120.**131.  $\frac{48}{48}$ ,  $\frac{48}{48}$ .133.  $\frac{96}{120}$ ,  $\frac{100}{120}$ ,  $\frac{76}{120}$ .134.  $\frac{27}{38}$ ,  $\frac{38}{38}$ ,  $\frac{33}{38}$ .

**Article 121.**

135.  $\frac{10}{8}, \frac{21}{8}$ .

142.  $\frac{16}{8}, \frac{4}{8}, \frac{28}{8}$ .

136.  $\frac{32}{8}, \frac{38}{8}$ .

143.  $\frac{227}{2475}, \frac{236}{2475}, \frac{276}{2475}, \frac{68}{2475}$ .

137.  $\frac{63}{108}, \frac{124}{108}$ .

144.  $\frac{700}{1000}, \frac{70}{1000}, \frac{7}{1000}, \frac{7000}{1000}$ .

138.  $\frac{125}{1200}, \frac{144}{1200}$ .

145.  $\frac{188}{24}, \frac{2}{24}, \frac{20}{24}, \frac{14}{24}$ .

139.  $\frac{12}{84}, \frac{32}{84}, \frac{27}{84}$ .

146.  $\frac{25}{28}, \frac{28}{28}, \frac{20}{28}$ .

140.  $\frac{125}{128}, \frac{70}{128}, \frac{72}{128}$ .

147.  $\frac{20}{28}, \frac{27}{28}, \frac{24}{28}$ .

141.  $\frac{42}{108}, \frac{50}{108}, \frac{51}{108}$ .

**Article 123.**

156.  $\frac{5}{8} + \frac{11}{12} + \frac{13}{16} = \frac{30}{48} + \frac{44}{48} + \frac{39}{48} = \frac{113}{48} = 2\frac{17}{48}, \text{ Ans.}$

157.

$$\frac{5}{14} + \frac{11}{18} + \frac{9}{20} = \frac{450}{1260} + \frac{770}{1260} + \frac{567}{1260} = \frac{1787}{1260} = 1\frac{527}{1260}, \text{ Ans.}$$

**Article 124.**

158.  $\frac{4}{9} + \frac{5}{14} + \frac{5}{42} = \frac{56}{126} + \frac{45}{126} + \frac{15}{126} = \frac{116}{126} = \frac{58}{63}, \text{ Ans.}$

159.  $\frac{15}{21} + \frac{11}{21} + \frac{17}{21} = \frac{43}{21} = 2\frac{1}{21}, \text{ Ans.}$

160.  $\frac{23}{24} + \frac{61}{96} = \frac{92}{96} + \frac{61}{96} = \frac{153}{96} = 1\frac{15}{32}, \text{ Ans.}$

161.

$$\frac{9}{7} + \frac{6}{11} + \frac{8}{14} = \frac{198}{154} + \frac{84}{154} + \frac{88}{154} = \frac{370}{154} = 2\frac{62}{77} = 2\frac{31}{37}, \text{ Ans.}$$

$$162. \frac{5}{17} + \frac{7}{51} + \frac{9}{68} = \frac{60}{204} + \frac{28}{204} + \frac{27}{204} = \frac{115}{204}, \text{ Ans.}$$

$$163. \frac{31}{6} + \frac{7}{9} + \frac{61}{24} = \frac{372}{72} + \frac{56}{72} + \frac{183}{72} = \frac{611}{72} = 8\frac{7}{8}, \text{ Ans.}$$

$$164. \frac{7}{8} + \frac{3}{10} + \frac{11}{10} + \frac{7}{18} = \frac{315}{360} + \frac{108}{360} + \frac{396}{360} + \frac{140}{360} = \frac{959}{360} = 2\frac{238}{360}, \text{ Ans.}$$

$$165. \frac{3}{25} + \frac{49}{50} + \frac{74}{75} + \frac{81}{100} = \frac{36}{300} + \frac{294}{300} + \frac{296}{300} + \frac{243}{300} = \frac{869}{300} = 2\frac{269}{300}, \text{ Ans.}$$

$$166. \frac{2}{5} + \frac{23}{36} + \frac{17}{9} + \frac{7}{1} = \frac{72}{180} + \frac{115}{180} + \frac{340}{180} + \frac{1260}{180} = \frac{1787}{180} = 9\frac{147}{180}, \text{ Ans.}$$

**Article 125.****167.**

$$\begin{array}{r} 15\frac{3}{4} \\ 24\frac{5}{8} \\ \hline 39 \\ 1\frac{3}{8} \\ \hline 40\frac{3}{8}, \text{ Ans.} \end{array} \quad \begin{array}{l} \frac{3}{4} + \frac{5}{8} = \\ \frac{6}{8} + \frac{5}{8} = \\ \frac{11}{8} = 1\frac{3}{8} \end{array}$$

**168.**

$$\begin{array}{r} 37\frac{5}{8} \\ 109\frac{3}{4} \\ 341\frac{2}{3} \\ \hline 487 \\ 1\frac{1}{2} \\ \hline 488\frac{1}{2}, \text{ Ans.} \end{array} \quad \begin{array}{l} \frac{5}{6} + \frac{2}{7} + \frac{8}{21} = \\ \frac{35}{42} + \frac{12}{42} + \frac{16}{42} = \\ \frac{63}{42} = 1\frac{1}{2} = 1\frac{1}{2} \end{array}$$

**169.**

$$\begin{array}{r} \$4\frac{1}{2} \\ 16\frac{1}{2} \\ 5\frac{7}{8} \\ \hline \$25 \\ 2\frac{1}{8} \\ \hline \$27\frac{1}{8}, \text{ Ans.} \end{array} \quad \begin{array}{l} \frac{3}{4} + \frac{1}{2} + \frac{7}{8} = \\ \frac{6}{8} + \frac{4}{8} + \frac{7}{8} = \\ \frac{17}{8} = 2\frac{1}{8} \end{array}$$

**170.**

$$\begin{array}{r} 160\frac{3}{4} \\ 67\frac{5}{8} \\ 85\frac{7}{10} \\ \hline 312 \\ 1\frac{33}{80} \\ \hline 313\frac{33}{80}, \text{ Ans.} \end{array} \quad \begin{array}{l} \frac{3}{4} + \frac{5}{16} + \frac{7}{20} = \\ \frac{60}{80} + \frac{25}{80} + \frac{28}{80} = \\ \frac{113}{80} = 1\frac{33}{80} \end{array}$$

**Article 126.**

$$182. \frac{21}{24} - \frac{31}{42} = \frac{147}{168} - \frac{124}{168} = \frac{23}{168}, \text{ Ans.}$$

$$183. \frac{29}{30} - \frac{23}{30} = \frac{6}{30} = \frac{1}{5}, \text{ Ans.}$$

$$184. \frac{17}{42} - \frac{3}{14} = \frac{17}{42} - \frac{9}{42} = \frac{8}{42} = \frac{4}{21}, \text{ Ans.}$$

**Article 127.**

$$185. \frac{17}{24} - \frac{7}{20} = \frac{85}{120} - \frac{42}{120} = \frac{43}{120}, \text{ Ans.}$$

$$186. \frac{11}{34} - \frac{1}{10} = \frac{110}{340} - \frac{34}{340} = \frac{76}{340} = \frac{19}{85}, \text{ Ans.}$$

$$187. \frac{31}{36} - \frac{9}{16} = \frac{124}{144} - \frac{81}{144} = \frac{43}{144}, \text{ Ans.}$$

$$188. \frac{167}{711} - \frac{19}{711} = \frac{148}{711}, \text{ Ans.}$$

$$189. \frac{48}{68} = \frac{12}{17}; \frac{37}{51} - \frac{12}{17} = \frac{37}{51} - \frac{36}{51} = \frac{1}{51}, \text{ Ans.}$$

$$190. \frac{97}{100} - \frac{17}{100} = \frac{80}{100} = \frac{4}{5}, \text{ Ans.}$$

$$191. \frac{1}{10} - \frac{19}{1000} = \frac{100}{1000} - \frac{19}{1000} = \frac{81}{1000}, \text{ Ans.}$$

$$192. \frac{41}{34} - \frac{17}{17} = \frac{41}{34} - \frac{34}{34} = \frac{7}{34}, \text{ Ans.}$$



$$193. \frac{43}{216} - \frac{19}{96} = \frac{172}{864} - \frac{171}{864} = \frac{1}{864}, \text{ Ans.}$$

$$194. \frac{15}{30} - \frac{15}{31} = \frac{465}{930} - \frac{450}{930} = \frac{15}{930} = \frac{1}{62}, \text{ Ans.}$$

$$196. \quad 31\frac{2}{3} = 31\frac{2}{3}$$

$$10\frac{1}{3} = 10\frac{4}{12}$$

$$\frac{21\frac{2}{3}}{21\frac{2}{3}}, \text{ Ans.}$$

$$197. \quad 63 = 62\frac{1}{2}$$

$$54\frac{7}{9} = 54\frac{7}{9}$$

$$\frac{8\frac{2}{3}}{8\frac{2}{3}}, \text{ Ans.}$$

$$198. \quad 73\frac{2}{10} = 73\frac{1}{5}$$

$$67\frac{1}{10} = 67\frac{1}{10}$$

$$\frac{6\frac{1}{10}}{6\frac{1}{10}}, \text{ Ans.}$$

$$199. \quad 29\frac{1}{3} = 29\frac{1}{3}$$

$$16\frac{2}{3} = 16\frac{2}{3}$$

$$\frac{13\frac{2}{3}}{13\frac{2}{3}}, \text{ Ans.}$$

$$200. \quad 311 = 310\frac{1}{2}$$

$$30\frac{1}{2} = 30\frac{1}{2}$$

$$\frac{280\frac{1}{2}}{280\frac{1}{2}}, \text{ Ans.}$$

$$201. \quad 103\frac{1}{3} = 103\frac{1}{3}$$

$$99\frac{1}{3} = 99\frac{1}{3}$$

$$\frac{4\frac{1}{3}}{4\frac{1}{3}} = 4\frac{1}{3}, \text{ Ans.}$$

$$202. \quad \$7\frac{1}{2} = \$7\frac{1}{2} = \$6\frac{3}{4}$$

$$\$1\frac{1}{2} = 1\frac{1}{2}$$

$$\frac{\$5\frac{1}{2}}{\$5\frac{1}{2}}, \text{ Ans.}$$

$$203. \quad 150 = 149\frac{1}{2}$$

$$147\frac{1}{2} = 147\frac{1}{2}$$

$$\frac{2\frac{1}{2}}{2\frac{1}{2}}, \text{ Ans.}$$

$$204. \quad 19\frac{1}{2} = 19\frac{1}{2}$$

$$17\frac{3}{10} = 17\frac{3}{10}$$

$$\frac{2\frac{1}{10}}{2\frac{1}{10}}, \text{ Ans.}$$

## Article 128.

$$212. 1\frac{1}{2}. \quad 214. 37\frac{1}{2}. \quad 216. 10\frac{1}{2}. \quad 218. 43\frac{1}{2}.$$

$$213. 15\frac{1}{2}. \quad 215. 49. \quad 217. 2\frac{2}{10}. \quad 219. 144.$$

$$221. \quad \frac{7}{18} \times \frac{3}{27} = \frac{21}{2} = 10\frac{1}{2}$$

$$\frac{2}{2}$$

$$40 \times 27 = \frac{1080}{1090\frac{1}{2}}, \text{ Ans.}$$

$$222. \quad \frac{4}{9} \times \frac{7}{63} = 28$$

$$81 \times 63 = 5103$$

$$\frac{5131}{5131}, \text{ Ans.}$$

$$223. \frac{3}{\cancel{10}5} \times \frac{5^4}{\cancel{7}5} = \frac{15}{7} = 2\frac{1}{7}$$

$$39 \times 75 = \frac{2925}{2927\frac{1}{2}}, \text{ Ans.}$$

$$224. \frac{5}{\cancel{1}5} \times \frac{5}{\cancel{8}0} = 25$$

$$125 \times 80 = \frac{10000}{10025}, \text{ Ans.}$$

$$225. \frac{5}{\cancel{8}} \times \frac{9}{\cancel{7}2} = \$45$$

$$8 \times 72 = \frac{576}{\$621}, \text{ Ans.}$$

**Article 129.**

232. 84.

234. 325.

236. 88.

238.  $17\frac{5}{7}$ .

233.  $24\frac{1}{3}$ .

235.  $97\frac{1}{2}$ .

237.  $165\frac{1}{3}$ .

239.  $243\frac{5}{7}$ .

**241.**

$$\frac{55}{\cancel{11}0} \times \frac{3}{\cancel{4}} = \frac{165}{2} = 82\frac{1}{2}$$

$$110 \times 9 = \frac{990}{1072\frac{1}{2}}, \text{ Ans.}$$

**242.**

$$85 \times \frac{1}{6} = \frac{85}{6} = 14\frac{1}{6}$$

$$85 \times 13 = \frac{1105}{1119\frac{1}{2}}, \text{ Ans.}$$

**243.**

$$\frac{7}{\cancel{8}4} \times \frac{5}{\cancel{1}2} = 35$$

$$84 \times 9 = \frac{756}{791}, \text{ Ans.}$$

**244.**

$$145 \times \frac{6}{7} = \frac{870}{7} = 124\frac{2}{7}$$

$$145 \times 11 = \frac{1595}{1719\frac{1}{2}}, \text{ Ans.}$$

$$245. \frac{25}{\cancel{5}0} \times \frac{5}{\cancel{8}} = \frac{125}{4} = 31\frac{1}{4}$$

$$50 \times 25 = \frac{1250}{1281\frac{1}{2}}, \text{ Ans.}$$

**Article 130.**

$$256. \frac{18}{19} \times \frac{11}{12} = \frac{33}{38}, \text{ Ans.} \quad \frac{3}{8} \times \frac{2}{5} = \frac{2}{5}, \text{ Ans.}$$

**Article 131.**

$$257. \frac{35}{72} \times \frac{3}{27} = \frac{105}{8} = 13\frac{1}{8}, \text{ Ans.} \quad 258. \frac{36}{65} \times \frac{4}{99} = \frac{16}{55}, \text{ Ans.}$$

**259.**

$$\frac{89}{267} \times \frac{7}{5} = \frac{623}{500} = 1\frac{123}{500}, \text{ Ans.}$$

**260.**

$$\frac{7}{9} \times \frac{2}{3} \text{ of } \frac{6}{11} = \frac{28}{99}, \text{ Ans.}$$

**261.**

$$\frac{12}{48} \times \frac{4}{5} \text{ of } \frac{5}{16} = \frac{12}{5} = 2\frac{2}{5}, \text{ Ans.}$$

**262.**

$$\frac{35}{17} \times \frac{1}{7} \text{ of } \frac{51}{70} = \frac{3}{14}, \text{ Ans.}$$

**263.**

$$\frac{3}{4} \text{ of } \frac{8}{9} \text{ of } \frac{10}{3} = \frac{20}{9} = 2\frac{2}{9}, \text{ Ans.}$$

**264.**

$$\frac{3}{4} \times \frac{4}{5} \times \frac{5}{6} \times \frac{6}{7} = \frac{3}{7}, \text{ Ans.}$$

$$265. 7\frac{1}{2} = \frac{47}{6}, 11\frac{3}{8} = \frac{91}{8}; \frac{91}{8} \times \frac{47}{6} = \frac{4277}{48} = \$89\frac{5}{48}, \text{ Ans.}$$

$$266. \frac{11}{5} \text{ of } \frac{7}{2} \times \frac{8}{5} \times \frac{2}{3} \text{ of } \frac{10}{1} = \frac{1232}{15} = 82\frac{2}{15}, \text{ Ans.}$$

$$267. \frac{3}{9} \text{ of } \frac{4}{7} \text{ of } \frac{9}{11} \times \frac{2}{3} \text{ of } \frac{18}{1} = \frac{144}{77} = 1\frac{67}{77}, \text{ Ans.}$$

268.

$$8\frac{3}{10} = \frac{83}{10}, 9\frac{1}{4} = \frac{37}{4}; \frac{2}{7} \text{ of } \frac{83}{10} \times \frac{4}{7} \text{ of } \frac{37}{4} = \frac{6142}{245} = 25\frac{17}{49}, \text{ Ans.}$$

269.

$$5\frac{7}{10} = \frac{57}{10}, 21\frac{9}{16} = \frac{345}{16}; \frac{69}{16} \times \frac{57}{10} = \frac{3933}{32} = \$122\frac{33}{32}, \text{ Ans.}$$

270.

$$4\frac{9}{10} = \frac{49}{10}, 3\frac{7}{12} = \frac{43}{12}; \frac{3}{4} \text{ of } \frac{43}{12} \times \frac{49}{10} = \frac{2107}{160} = 13\frac{27}{160}, \text{ Ans.}$$

## Article 132.

282. $2\frac{7}{18}$ .	289. $5\frac{4}{13}$ .	305. $29\frac{1}{11}$ .	311. 162.
283. $3\frac{1}{3}$ .	291. $\frac{3}{40}$ .	306. $87\frac{1}{2}$ .	312. $111\frac{1}{3}$ .
284. $5\frac{3}{17}$ .	292. $15\frac{7}{10}$ .	307. $52\frac{1}{2}$ .	313. $214\frac{1}{2}$ .
285. $3\frac{1}{18}$ .	293. $3\frac{1}{2}$ .	308. 170.	314. 64.
286. $5\frac{47}{80}$ .	294. $\$6\frac{3}{4}$ .	309. $151\frac{1}{11}$ .	315. 16.
287. $\frac{4}{9}$ .	304. $88\frac{1}{2}$ .	310. 40.	316. 7.
288. $8\frac{1}{25}$ .			

$$327. \frac{7}{9} \div \frac{4}{7} = \frac{7}{9} \times \frac{7}{4} = \frac{49}{36} = 1\frac{13}{36}, \text{ Ans.}$$

$$328. \frac{12}{25} \div \frac{9}{10} = \frac{12}{25} \times \frac{10}{9} = \frac{8}{15}, \text{ Ans.}$$

## Article 133.

329.

$$\frac{25}{39} \div \frac{10}{13} = \frac{\overset{5}{\cancel{25}}}{\underset{3}{\cancel{39}}} \times \frac{\overset{13}{\cancel{13}}}{\underset{2}{\cancel{10}}} = \frac{5}{6}, \text{ Ans.}$$

330.

$$\frac{12}{49} \div \frac{3}{7} = \frac{\overset{4}{\cancel{12}}}{\underset{7}{\cancel{49}}} \times \frac{\overset{7}{\cancel{7}}}{\underset{3}{\cancel{3}}} = \frac{4}{7}, \text{ Ans.}$$

$$331. \frac{11}{12} \div \frac{47}{56} = \frac{11}{\underset{3}{\cancel{12}}} \times \frac{\overset{14}{\cancel{56}}}{\underset{47}{\cancel{47}}} = \frac{154}{141} = 1\frac{13}{141}, \text{ Ans.}$$

$$332. \frac{17}{20} \div \frac{3}{5} = \frac{17}{\underset{4}{\cancel{20}}} \times \frac{\overset{5}{\cancel{5}}}{\underset{3}{\cancel{3}}} = \frac{17}{12} = 1\frac{5}{12}, \text{ Ans.}$$

$$333. \frac{38}{275} \div \frac{133}{385} = \frac{\overset{2}{\cancel{38}}}{\underset{5}{\cancel{275}}} \times \frac{\overset{7}{\cancel{385}}}{\underset{133}{\cancel{133}}} = \frac{2}{5}, \text{ Ans.}$$

$$334. \frac{41}{33} \div \frac{63}{11} = \frac{41}{\underset{3}{\cancel{33}}} \times \frac{\overset{11}{\cancel{11}}}{\underset{63}{\cancel{63}}} = \frac{41}{189}, \text{ Ans.}$$

$$335. 9\frac{3}{4} \div 4\frac{1}{2} = \frac{\overset{25}{\cancel{75}}}{\underset{4}{\cancel{8}}} \times \frac{\overset{2}{\cancel{9}}}{\underset{3}{\cancel{6}}} = \frac{25}{12} = 2\frac{1}{12}, \text{ Ans.}$$

$$336. \frac{208}{135} \div \frac{130}{441} = \frac{\overset{104}{\cancel{208}}}{\underset{15}{\cancel{135}}} \times \frac{\overset{49}{\cancel{441}}}{\underset{130}{\cancel{130}}} = \frac{5096}{975} = 5\frac{328}{975}, \text{ Ans.}$$

$$337. 17\frac{3}{7} \div 5\frac{1}{2} = \frac{\overset{73}{\cancel{365}}}{\underset{7}{\cancel{21}}} \times \frac{\overset{2}{\cancel{6}}}{\underset{35}{\cancel{35}}} = \frac{146}{49} = 2\frac{48}{49}, \text{ Ans.}$$

$$338. 100\frac{5}{8} \div 8\frac{3}{4} = \frac{905}{9} \times \frac{8}{26} = \frac{905}{78} = 11\frac{7}{8}, \text{ Ans.}$$

$$339. \frac{14}{25} \div \frac{14}{16} = \frac{14}{25} \times \frac{16}{14} = \frac{16}{25}, \text{ Ans.}$$

$$340. 11\frac{1}{4} = \frac{45}{4}; \frac{45}{4} \div \frac{5}{8} = \frac{45}{4} \times \frac{8}{5} = 18, \text{ Ans.}$$

341.

$$15\frac{3}{10} = \frac{153}{10}, 3\frac{3}{5} = \frac{18}{5}; \frac{153}{10} \div \frac{18}{5} = \frac{153}{10} \times \frac{5}{18} = \frac{17}{4} = 4\frac{1}{4}, \text{ Ans.}$$

$$343. \frac{9}{13} = \frac{9}{13} \div \frac{2}{5} = \frac{9}{13} \times \frac{5}{2} = \frac{45}{26} = 1\frac{19}{26}, \text{ Ans.}$$

$$344. \frac{12}{5} = \frac{12}{5} \div \frac{5}{8} = \frac{12}{5} \times \frac{8}{5} = \frac{96}{5} = 19\frac{1}{5}, \text{ Ans.}$$

$$345. \frac{6\frac{7}{8}}{8} = \frac{44}{7} \div \frac{3}{8} = \frac{44}{7} \times \frac{8}{3} = \frac{352}{21} = 16\frac{16}{21}, \text{ Ans.}$$

$$346. \frac{5\frac{1}{2}}{11} = \frac{11}{2} \div \frac{11}{1} = \frac{11}{2} \times \frac{1}{11} = \frac{1}{2}, \text{ Ans.}$$

$$347. \frac{19}{2\frac{1}{11}} = \frac{19}{1} \div \frac{26}{11} = \frac{19}{1} \times \frac{11}{26} = \frac{209}{26} = 8\frac{1}{26}, \text{ Ans.}$$

$$348. \frac{6\frac{3}{8}}{8\frac{3}{8}} = \frac{20}{3} \div \frac{53}{6} = \frac{20}{3} \times \frac{6}{53} = \frac{40}{53}, \text{ Ans.}$$

$$349. \frac{10\frac{7}{8}}{83\frac{1}{4}} = \frac{75}{7} \div \frac{333}{4} = \frac{75}{7} \times \frac{4}{333} = \frac{100}{777}, \text{ Ans.}$$

$$350. 23\frac{3}{4} = \frac{95}{4}; \quad \frac{95}{4} \div \frac{19}{36} = \frac{95}{4} \times \frac{36}{19} = 45, \text{ Ans.}$$

**351.**

$$31\frac{1}{4} = \frac{440}{14}, \quad 125\frac{1}{4} = \frac{880}{7}; \quad \frac{880}{7} \div \frac{440}{14} = \frac{880}{7} \times \frac{14}{440} = 4, \text{ Ans.}$$

**Article 134.**

359. $\frac{3}{8}$ .	363. $\frac{1}{8}$ .	367. $1\frac{1}{2}$ .	371. \$52.50.
360. $\frac{4}{5}$ .	364. $\frac{7}{8}$ .	368. $1\frac{1}{2}$ .	372. $4\frac{3}{8}$ .
361. $\frac{7}{8}$ .	365. $\frac{4}{5}$ .	369. $1\frac{1}{7}$ .	373. $\frac{3}{4}$ .
362. $\frac{1}{2}$ .	366. $1\frac{1}{8}$ .	370. 112.	374. \$4 $\frac{27}{100}$ .

$$388. \frac{39}{9} \times 25 = 975, \text{ Ans.}$$

**Article 135.**

$$389. \frac{152}{9} \times 11 = 1672, \text{ Ans.} \quad 390. \frac{81}{11} \times 23 = 1863, \text{ Ans.}$$

$$391. \frac{1600}{125} \times 100 = 6400, \text{ Ans.}$$

$$392. \frac{273}{21} \times 50 = 650; \quad \frac{4}{5} \text{ of } 130 = 104, \text{ Ans.}$$

$$393. \frac{200}{8} \times 15 = 3000; \quad \$3000 - \$1600 = \$1400, \text{ Ans.}$$

$$394. \frac{12}{17} \text{ of } \frac{20}{340} = 240; \frac{30}{8} \times 11 = 330, \text{ Ans.}$$

$$395. \frac{3}{5} \div \frac{9}{10} = \frac{8}{5} \times \frac{10}{9} = \frac{2}{3}, \text{ Ans.}$$

$$396. 7\frac{1}{2} = \frac{15}{2}; \frac{15}{2} \div \frac{5}{17} = \frac{15}{2} \times \frac{17}{5} = \frac{51}{2} = 25\frac{1}{2}, \text{ Ans.}$$

$$397. \frac{7}{7} - \frac{3}{7} = \frac{4}{7}; \frac{231}{4} \times 7 = \frac{1617}{2} = \$808\frac{1}{2}, \text{ Ans.}$$

$$398. \frac{1310}{3930} \times 5 = \$6550, \text{ Ans.}$$

$$399. 1\frac{1}{8} = \frac{21}{16}; \frac{125}{2000} \times 21 = \$2625, \text{ Ans.}$$

$$400. \frac{9}{9} + \frac{2}{9} = \frac{11}{9}; \frac{991}{10901} \times 9 = \$8919, \text{ Ans.}$$

## MISCELLANEOUS EXERCISES.

$$401. 43\frac{1}{2} = \frac{87}{2}; \frac{87}{2} \div \frac{5}{6} = \frac{87}{2} \times \frac{6}{5} = \frac{261}{5} = 52\frac{1}{5}, \text{ Ans.}$$

$$402. 2\frac{1}{2} = \frac{5}{2}; \frac{15}{16} \div \frac{5}{2} = \frac{15}{16} \times \frac{2}{5} = \frac{3}{8}, \text{ Ans.}$$



$$403. 12 \times \frac{3}{4} \div \frac{4}{5} = \overset{3}{\cancel{12}} \times \frac{3}{\cancel{4}} \times \frac{5}{4} = \frac{45}{4} = 11\frac{1}{4}, \text{ Ans.}$$

$$404. \overset{.80}{\frac{\cancel{5.60}}{\cancel{7}}} \times 8 = \$6.40, \text{ Ans.}$$

405.

$$\frac{7}{\cancel{11}} \text{ of } 12\frac{1}{2} = \frac{7}{8} \times \frac{11}{3} \times \frac{25}{2} = \frac{1925}{48}; \quad \frac{1}{7\frac{1}{2}} \text{ of } 8\frac{1}{2} = \frac{1}{3} \times \frac{2}{\cancel{15}} \times \frac{\overset{7}{\cancel{35}}}{\cancel{4}} = \frac{7}{18}$$

$$\frac{1925}{48} \div \frac{7}{18} = \frac{275}{\cancel{48}} \times \frac{\overset{3}{\cancel{18}}}{\cancel{7}} = \frac{825}{8} = 103\frac{1}{8}, \text{ Ans.}$$

$$406. 20 \div 7\frac{2}{3} = 20 \times \frac{8}{59} = \frac{160}{59} = 2\frac{42}{59}, \text{ Ans.}$$

$$407. 60 \div \frac{9}{11} = \overset{20}{\cancel{60}} \times \frac{11}{\underset{3}{\cancel{9}}} = \frac{220}{3} = 73\frac{1}{3}, \text{ Ans.}$$

$$408. 106\frac{1}{2} \div 8 = \frac{961}{9} \times \frac{1}{8} = \frac{961}{72} = \$13\frac{5}{8}, \text{ Ans.}$$

$$409. \$350 - \$125 = \$225; \quad \frac{225}{350} = \frac{9}{14}, \text{ Ans.}$$

$$410. 19 \div 2\frac{3}{4} = 19 \times \frac{7}{17} = \frac{133}{17} = 7\frac{9}{17} \text{ pieces, Ans.}$$

$$\frac{14}{17} \text{ of } 2\frac{3}{4} \text{ ft.} = 2 \text{ ft., Ans.}$$

$$411. \$67\frac{1}{2} \div 10\frac{1}{2} = \frac{\overset{5}{\cancel{135}}}{\cancel{2}} \times \frac{\underset{3}{\cancel{4}}}{\cancel{81}} = \frac{20}{3} = \$6\frac{2}{3}, \text{ Ans.}$$

$$412. \frac{21}{27} = \frac{7}{9}, \quad \frac{14}{18} = \frac{7}{9}; \quad \frac{7}{9} \div \frac{7}{9} = \frac{7}{9} \times \frac{9}{7} = 1, \text{ Ans.}$$

$$413. \frac{14}{8} \text{ of } \frac{36}{7} \times \frac{8}{1} = 192; \quad 28\frac{1}{2} \div 7\frac{1}{8} = \frac{57}{2} \times \frac{8}{57} = 4$$

$$\frac{192}{4} = 48, \text{ Ans.}$$

$$414. 4\frac{1}{5} \div 2\frac{1}{5} = \frac{21}{5} \times \frac{5}{7} = \frac{9}{5} = 1\frac{4}{5}, \text{ Ans.}$$

$$415. \frac{1}{9} \text{ of } 1\frac{1}{2} \times 4\frac{1}{2} = \frac{1}{9} \times \frac{5}{4} \times \frac{9}{2} = \frac{5}{8}$$

$$\frac{5}{56} \text{ of } 1\frac{1}{3} \times 3\frac{1}{2} = \frac{5}{56} \times \frac{4}{3} \times \frac{7}{2} = \frac{5}{12}$$

$$\frac{5}{8} \div \frac{5}{12} = \frac{5}{8} \times \frac{12}{5} = 1\frac{1}{2}, \text{ Ans.}$$

$$416. \$20 \div 6\frac{1}{2} = \frac{4}{20} \times \frac{4}{25} = \frac{16}{5} = \$3\frac{1}{5}, \text{ per acre;}$$

$$\$3\frac{1}{5} \times 9\frac{3}{5} = \frac{16}{5} \times \frac{48}{5} = \$30, \text{ Ans.}$$

417.

$$50 \div 10\frac{1}{2} = \frac{25}{50} \times \frac{5}{54} = \frac{125}{27} = 4\frac{1}{3}; \quad 12\frac{1}{2} \div 4\frac{1}{3} = 8\frac{1}{6}, \text{ Ans.}$$

$$418. \$236 \div 11\frac{1}{2} = \frac{4}{236} \times \frac{5}{59} = \$20, \text{ cost of one acre ;}$$

$$20\frac{1}{10} \times 20 = \frac{207}{10} \times \frac{2}{20} = \$414, \text{ Ans.}$$

419.

$$\$969 \div 2\frac{3}{4} = \frac{51}{969} \times \frac{8}{19} = \$408 ; \$969 - \$408 = \$561, \text{ Ans.}$$

**Article 136.**

$$34. \begin{array}{r} 3 \overline{) 2157} \\ 3 \overline{) 3741} \end{array} = \frac{719}{1247}, \text{ Ans.}$$

$$35. \begin{aligned} 1728 &= 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3 \\ 2880 &= 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 5 \end{aligned}$$

$$2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 = 576, \text{ Ans.}$$

$$36. \begin{aligned} 243 &= 3 \times 3 \times 3 \times 3 \times 3 \\ 972 &= 2 \times 2 \times 3 \times 3 \times 3 \times 3 \times 3 \\ 576 &= 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \end{aligned}$$

$$2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 3 \times 3 = 15552, \text{ Ans.}$$

$$37. \frac{5+6}{6+7} = \frac{11}{13}; \frac{11}{13} - \frac{5}{6} = \frac{66}{78} - \frac{65}{78} = \frac{1}{78}; \frac{11}{13} \text{ is } \frac{1}{78} \text{ greater}$$

$$\text{than } \frac{5}{6}; \frac{6}{7} - \frac{11}{13} = \frac{78}{91} - \frac{77}{91} = \frac{1}{91}; \frac{11}{13} \text{ is } \frac{1}{91} \text{ less than } \frac{6}{7}, \text{ Ans.}$$

$$38. \frac{38}{60} = \frac{190}{300}, \frac{3}{4} = \frac{225}{300}, \frac{17}{100} = \frac{51}{300};$$

$$\frac{190}{300} + \frac{225}{300} + \frac{51}{300} = \frac{466}{300} = 1\frac{83}{150}, \text{ Ans.}$$

$$\begin{array}{r} \frac{2}{3} \\ 1\frac{1}{3} \\ 3\frac{2}{3} \\ 13\frac{17}{10} \\ \underline{17} \\ 1\frac{28}{10} \\ \underline{18\frac{28}{10}}, \text{ Ans.} \end{array}$$

39.

$$\frac{3}{4} + \frac{1}{8} + \frac{2}{5} + \frac{7}{10} =$$

$$\frac{30}{40} + \frac{5}{40} + \frac{16}{40} + \frac{28}{40} = \frac{79}{40} = 1\frac{39}{40}$$

$$40. 16 - \frac{117}{237} = 15\frac{17}{237} - \frac{32}{237} = 15\frac{14}{237}, \text{ Ans.}$$

$$41. 24\frac{1}{3} + 9\frac{2}{3} = 33\frac{3}{3} = 34, \text{ Ans.}$$

$$42. 2\frac{2}{3} \times \frac{7}{8} \text{ of } \frac{9}{10} = \frac{17}{8} \times \frac{7}{8} \times \frac{9}{10} = \frac{357}{160} = 2\frac{37}{80}, \text{ Ans.}$$

$$43. \frac{3}{7} \text{ of } \frac{5}{9} = \frac{5}{21}, \quad \frac{1}{2} \text{ of } \frac{6}{9} = \frac{1}{3};$$

$$\frac{1}{3} - \frac{5}{21} = \frac{7}{21} - \frac{5}{21} = \frac{2}{21}, \text{ Ans.}$$

$$44. 229\frac{1}{2} \div 8\frac{1}{2} = \frac{459}{2} \times \frac{2}{17} = 27, \text{ Ans.}$$

$$45. \frac{31}{97} \div 3\frac{1}{3} = \frac{31}{97} \times \frac{97}{301} = \frac{31}{301}, \text{ Ans.}$$

$$46. \quad \begin{array}{l} 6 = 2 \times 3 \\ 8 = 2 \times 2 \times 2 \\ 9 = 3 \times 3 \end{array}$$

$$2 \times 2 \times 2 \times 3 \times 3 = 72, \text{ Least common multiple.}$$

$$72 + 4 = 76, \text{ Ans.}$$

$$47. \frac{5}{6} + \frac{13}{18} + \frac{5}{8} = \frac{60}{72} + \frac{52}{72} + \frac{45}{72} = \frac{157}{72} = 2\frac{1}{3}, \text{ Ans.}$$

$$48. \frac{4}{7} \times \frac{13}{13} = \frac{52}{91}, \text{ Ans.}$$

$$49. 53 - 27 = 26; 26 \times \frac{1}{5} = \frac{26}{5} = 5\frac{1}{5}; \frac{1}{2} \text{ of } \frac{1}{5} = \frac{1}{10};$$

$$\frac{1}{10} + \frac{1}{5} = \frac{3}{10}, \text{ what each boy has; } 27 \times \frac{3}{10} = \frac{81}{10} = 8\frac{1}{10};$$

$$8\frac{1}{10} + 5\frac{1}{5} = 13\frac{3}{10}, \text{ Ans.}$$

$$50. \frac{1}{12} + \frac{1}{4} + \frac{1}{8} = \frac{2}{24} + \frac{6}{24} + \frac{3}{24} = \frac{11}{24}$$

$$\frac{1}{3} + \frac{1}{6} + \frac{1}{9} = \frac{6}{18} + \frac{3}{18} + \frac{2}{18} = \frac{11}{18}$$

$$\frac{11}{24} \div \frac{11}{18} = \frac{11}{24} \times \frac{18}{11} = \frac{3}{4}, \text{ Ans.}$$

$$51. \frac{2}{3} \text{ of } \frac{12}{7} = \frac{8}{7}, \frac{3\frac{1}{2}}{16} = \frac{7}{2} \times \frac{1}{16} = \frac{7}{32}; \frac{\frac{8}{7}}{\frac{7}{32}} = \frac{1}{4}, \text{ Ans.}$$

$$52. \frac{7}{12} \text{ of } 2\frac{1}{4} = \frac{7}{12} \times \frac{11}{4} = \frac{77}{48}; \frac{\frac{77}{48}}{3} = \frac{77}{48} \times \frac{1}{3} = \frac{77}{144}, \text{ Ans.}$$

$$53. \frac{7}{8} - \frac{6}{7} = \frac{49}{56} - \frac{48}{56} = \frac{1}{56}; \frac{1}{56} \text{ of the number} = 10;$$

$$\frac{56}{56} \text{ of the number} = 56 \times 10 = 560, \text{ Ans.}$$

$$54. \frac{\frac{5}{7}}{\frac{7}{13}} \text{ of } \frac{\frac{4}{16}}{\frac{4}{3}} \text{ of } \frac{\frac{5}{33}}{4} \times \frac{11}{5} = \frac{11}{16}, \text{ Ans.}$$

$$55. \frac{3}{4} \text{ the cost} = \$105\frac{3}{4}; \frac{1}{4} \text{ the cost} = \frac{1}{3} \text{ of } \$105\frac{3}{4} = \$35\frac{1}{4};$$

$$\frac{4}{4} \text{ the cost} = 4 \times \$35\frac{1}{4} = \$141, \text{ Ans.}$$

$$56. 13\frac{7}{10} \times 7\frac{1}{8} = \frac{137}{10} \times \frac{63}{8} = \frac{8631}{80} = \$107\frac{71}{80}, \text{ Ans.}$$

$$57. \$3\frac{3}{4} \div 1\frac{1}{8} = \frac{15}{\frac{225}{64}} \times \frac{8}{15} = \frac{15}{8} = \$1\frac{7}{8}, \text{ Ans.}$$

$$58. \$350\frac{2}{5} \div \$17\frac{1}{4} = \frac{79}{\frac{5609}{16}} \times \frac{4}{71} = \frac{79}{4} = 19\frac{3}{4}, \text{ Ans.}$$

59.

$$\frac{3}{8} \text{ cost } \$2.13; \frac{1}{8} \text{ cost } \frac{1}{3} \text{ of } \$2.13 = \$0.71; \frac{8}{8} \text{ cost } 8 \times \$0.71 = \$5.68;$$

$$10\frac{1}{2} \times \$5.68 = \$59.64, \text{ Ans.}$$

$$60. \frac{5}{5} - \frac{2}{5} = \frac{3}{5}; \frac{4}{7} \text{ of } \frac{3}{5}, \text{ or } \frac{12}{35}, = 24; \frac{1}{35} = 2; \frac{35}{35} = 70, \text{ Ans.}$$

$$61. \frac{3}{4} \text{ of } \frac{7}{28} \text{ men} = 21 \text{ men}; \frac{28 \times 42}{21} = 56 \text{ days, Ans.}$$

$$62. 6\frac{3}{4} \times 1\frac{1}{4} \div \frac{3}{4} = \frac{27}{4} \times \frac{5}{4} \times \frac{4}{3} = \frac{45}{4} = 11\frac{1}{4} \text{ yards, Ans.}$$

$$63. \frac{5}{7} \text{ of } 1\frac{4}{13} = \frac{5}{7} \times \frac{19}{13} = \frac{95}{91}, \frac{27}{34} = \frac{19}{7} \times \frac{4}{13} = \frac{76}{91};$$

$$\frac{95}{91} \div \frac{76}{91} = \frac{95}{91} \times \frac{91}{76} = \frac{95}{76} = 1\frac{1}{4}, \text{ Ans.}$$

$$64. \frac{5}{16} + \frac{7}{12} = \frac{15}{48} + \frac{28}{48} = \frac{43}{48}; \frac{48}{48} - \frac{43}{48} = \frac{5}{48}, \text{ C.'s share.}$$

$$\left. \begin{array}{l} \frac{5}{16} \text{ of } \$\overset{60}{960} = \$300, \text{ A.'s gain,} \\ \frac{7}{12} \text{ of } \$\overset{80}{960} = \$560, \text{ B.'s gain,} \\ \frac{5}{48} \text{ of } \$\overset{20}{960} = \$100, \text{ C.'s gain,} \end{array} \right\} \text{Ans.}$$

65.

$$\frac{7}{8} \text{ cost } \$\frac{9}{8}; \frac{1}{8} \text{ cost } \frac{1}{7} \text{ of } \frac{9}{8} = \$\frac{9}{56}; \frac{8}{8} \text{ cost } 8 \times \frac{9}{56} = \frac{9}{7} = \$1\frac{2}{7};$$

$$\$ \frac{9}{11} \div \$1\frac{2}{7} = \frac{9}{11} \times \frac{7}{9} = \frac{7}{11} \text{ gallon, Ans.}$$

$$66. \frac{2}{3} = \$3300; \frac{1}{3} = \frac{1}{2} \text{ of } \$3300 = \$1650;$$

$$\frac{3}{3} = 3 \times \$1650 = \$4950;$$

$$\frac{3}{10} \text{ of } \$\overset{495}{4950} = \$1485, \text{ Ans.}$$

$$67. \$5\frac{1}{6} \div 7\frac{1}{4} = \frac{\overset{3}{87}}{16} \times \frac{4}{29} = \$\frac{3}{4}, \text{ cost of 1 pound;}$$

$$\$23\frac{1}{2} \div \$\frac{3}{4} = \frac{\overset{63}{189}}{8} \times \frac{4}{3} = \frac{63}{2} = 31\frac{1}{2} \text{ pounds, Ans.}$$

$$68. \$31\frac{1}{2} \div 4 = \frac{59}{16} \times \frac{1}{4} = \$\frac{59}{64}, \text{ cost of one bushel.}$$

$$\$ \frac{59}{64} \times 7 = \frac{413}{64} = \$6\frac{29}{64}, \text{ Ans.}$$

69.  $\$ \frac{3}{4} + \$ 1\frac{1}{2} = \$ 2\frac{1}{4}$ , what B receives ;

$$\frac{2}{3} \text{ of } 2\frac{1}{4} = \frac{2}{3} \text{ of } \frac{9}{4} = \$ 1\frac{1}{2}, \text{ what A receives.}$$

$$\$ 1\frac{1}{2} - \$ \frac{3}{4} = \frac{6}{4} - \frac{3}{4} = \$ \frac{3}{4}, \text{ Ans.}$$

70. A spends  $\frac{4}{4} - \frac{1}{4} = \frac{3}{4}$  of his income ;

B spends  $1\frac{1}{2} \times \frac{3}{4} = \frac{3}{2} \times \frac{3}{4} = \frac{9}{8}$  of his income ;

$$\frac{9}{8} - \frac{8}{8} = \frac{1}{8}, \text{ B spends more than income ; } \frac{1}{8} = \$ 62\frac{1}{2} ;$$

$$\frac{8}{8} = 8 \times \$ 62\frac{1}{2} = \$ 500, \text{ Ans.}$$

71. One pipe empties  $\frac{1}{5}$  of the contents in 1 minute ; the other pipe empties  $\frac{1}{7}$  of the contents in 1 minute ; together they empty  $\frac{1}{5} + \frac{1}{7}$  of the contents per minute.

$$\frac{1}{5} + \frac{1}{7} = \frac{5}{35} + \frac{7}{35} = \frac{12}{35}$$

7 out of every 12 parts, or  $\frac{7}{12}$ , runs through the larger pipe.

$\frac{7}{12}$  of 960 gal. = 560 gal. The remainder, or 400 gal., runs through the other pipe.

$$72. \frac{1}{6 + 7\frac{1}{2}} = 1 \times \frac{2}{27} = \frac{2}{27} ; \frac{3}{5} \text{ of } 1\frac{2}{3} = \frac{3}{5} \times \frac{5}{3} = 1 ;$$

$$1\frac{2}{3} \div 1\frac{1}{2} = \frac{9}{7} \times \frac{4}{5} = \frac{36}{35} ;$$

$$\frac{2}{27} + 1 + \frac{36}{35} + \frac{9}{35} = \frac{70}{945} + \frac{945}{945} + \frac{972}{945} + \frac{243}{945} = \frac{2230}{945} = 2\frac{446}{189}, \text{ Ans}$$



**Article 142.****54.** 71.5.**55.** 19.000; 43.600; 0.640; 53.000.**56.** 15.60; 4.70; 13.00.**57.** 18.0156; 401.6000; 176.4700.**63.**  $\frac{2}{10}$ .**64.**  $\frac{7}{8}$ .**Article 143.****65.**  $\frac{1}{10}$ .**70.**  $\frac{3}{8}$ .**75.**  $9\frac{3}{8}$ .**79.**  $\frac{1}{84}$ .**66.**  $\frac{561}{1000}$ .**71.**  $\frac{48}{195}$ .**76.**  $115\frac{7}{8}$ .**84.** .6.**67.**  $\frac{27}{500}$ .**72.**  $11\frac{1}{2}$ .**77.**  $\frac{11}{800}$ .**86.** .416 $\frac{2}{3}$ .**68.**  $\frac{3}{8}$ .**73.**  $4\frac{7}{16}$ .**78.**  $200\frac{2}{3}$ .**87.** .3636 $\frac{4}{11}$ .**69.**  $\frac{6}{8}$ .**74.**  $\frac{3}{2}$ .**Article 144.****88.** .275.**93.** 4.096.**98.** .5833.**89.** .4375.**94.** 4.015625.**99.** .9474.**90.** .03125.**95.** 2.09375.**100.** .0933 $\frac{1}{3}$ .**91.** .7.**96.** 5.0078125.**101.** .135135.**92.** .32.**97.** .0769 $\frac{2}{13}$ .**102.****103.****104.** $\frac{3}{8} = .667$  $15\frac{5}{8} = 15.8333$  $\frac{31}{8} = .553$  $20\frac{5}{8} = 20.6250$ 

15.057000

 $\frac{3}{80} = .012$  $12\frac{1}{2} = 12.8000$  $3\frac{41}{333} = 3.123123$  $\frac{1.232}{1.232}, \text{ Ans.}$  $\frac{2.68}{2.68} = 2.6800$  $\frac{11.933877}{11.933877}, \text{ Ans.}$  $\frac{51.9383}{51.9383}, \text{ Ans.}$ **Article 145.****111.** 671**112.** 18.72

.305

7.1

33551872

2013

13104

204.655, Ans.132.912, Ans.

**Article 146.**

$$\begin{array}{r}
 115. \quad 5.64 \\
 \quad \quad 45 \\
 \hline
 \quad 2820 \\
 \quad 2256 \\
 \hline
 253.80, \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 116. \quad 96.5 \\
 \quad \quad 100 \\
 \hline
 9650.0, \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 117. \quad 6.34 \\
 \quad \quad .0023 \\
 \hline
 \quad 1902 \\
 \quad 1268 \\
 \hline
 .014582, \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 118. \quad 42.2 \\
 \quad 2.004 \\
 \hline
 \quad 1688 \\
 \quad 844 \\
 \hline
 84.5688, \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 119. \quad 1671 \\
 \quad \quad .013 \\
 \hline
 \quad 5013 \\
 \quad 1671 \\
 \hline
 21.723, \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 120. \quad .563 \\
 \quad \quad 47 \\
 \hline
 \quad 3941 \\
 \quad 2252 \\
 \hline
 26.461, \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 121. \quad 19634 \\
 \quad \quad .0073 \\
 \hline
 \quad 58902 \\
 \quad 137438 \\
 \hline
 143.3282, \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 122. \quad .0703 \\
 \quad \quad .0055 \\
 \hline
 \quad 3515 \\
 \quad 3515 \\
 \hline
 .00038665, \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 123. \quad .0505 \\
 \quad \quad .001 \\
 \hline
 .0000505, \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 124. \quad .0076 \\
 \quad \quad .017 \\
 \hline
 \quad 532 \\
 \quad 76 \\
 \hline
 .0001292, \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 125. \quad 1000000 \\
 \quad \quad .000001 \\
 \hline
 1.000000, \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 126. \quad \$4.50 \\
 \quad \quad 35.75 \\
 \hline
 \quad 2250 \\
 \quad 3150 \\
 \hline
 \quad 2250 \\
 \quad 1350 \\
 \hline
 \$160.8750, \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 127. \quad \$4.62 \\
 \quad 13.375 \\
 \hline
 \quad 2310 \\
 \quad 3234 \\
 \hline
 \quad 1386 \\
 \quad 1386 \\
 \hline
 \quad 462 \\
 \hline
 \$61.79250, \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 128. \quad .101 \\
 \quad \quad .10101 \\
 \hline
 \quad 101
 \end{array}$$

$$\begin{array}{r}
 138. \quad 4 \overline{) 1.264} \\
 \hline
 \quad .316, \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 139. \quad .05 \overline{) .00115} \\
 \hline
 \quad .023, \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 \quad 101 \\
 \quad 101 \\
 \hline
 .01020201, \text{ Ans.}
 \end{array}$$

**Article 147.****142.** 125.36, Ans.

$$\begin{array}{r}
 6\overline{)25.} \overline{)783} \overline{)50.00} \\
 \underline{625} \\
 1585 \\
 \underline{1250} \\
 3350 \\
 \underline{3125} \\
 2250 \\
 \underline{1875} \\
 3750 \\
 \underline{3750}
 \end{array}$$

**143.** .756, Ans.

$$\begin{array}{r}
 \overline{)025.} \overline{)018.900} \\
 \underline{175} \\
 140 \\
 \underline{125} \\
 150 \\
 \underline{150}
 \end{array}$$

**144.**  $\overline{)001.} \overline{)010.01}$   
10.01, Ans.**145.** 790, Ans.

$$\begin{array}{r}
 \overline{)00135.} \overline{)106650.} \\
 \underline{945} \\
 1215 \\
 \underline{1215} \\
 0
 \end{array}$$

**146.** .081, Ans.

$$\begin{array}{r}
 1\overline{)08.} \overline{)08.748} \\
 \underline{864} \\
 108 \\
 \underline{108}
 \end{array}$$

**147.** .893+, Ans.

$$\begin{array}{r}
 \overline{)9147.} \overline{)8170.000} \\
 \underline{73176} \\
 85240 \\
 \underline{82323} \\
 29170 \\
 \underline{27441} \\
 1729
 \end{array}$$

**148.** .001365, Ans.

$$\begin{array}{r}
 1000 \overline{)1.365000} \\
 \underline{1000} \\
 3650 \\
 \underline{3000} \\
 6500 \\
 \underline{6000} \\
 5000 \\
 \underline{5000}
 \end{array}$$

**149.** 4000, Ans.

$$\begin{array}{r}
 \overline{)018.} \overline{)72000.} \\
 \underline{72} \\
 000
 \end{array}$$

**150.** 150000, Ans.

$$\begin{array}{r} 10037. ) 5550000. \\ \end{array}$$

$$\begin{array}{r} 37 \\ \underline{185} \\ 185 \\ \underline{\phantom{0000}} \\ 0000 \end{array}$$

**151.**

1.12, Ans.

$$\begin{array}{r} 00143. ) 00160.16 \\ \end{array}$$

$$\begin{array}{r} 143 \\ \underline{171} \\ 143 \\ \underline{286} \\ 286 \end{array}$$

**152.** 360.985—, Ans.

$$\begin{array}{r} 264. ) 95300.000 \\ \end{array}$$

$$\begin{array}{r} 792 \\ \underline{1610} \\ 1584 \\ \underline{2600} \\ 2376 \\ \underline{2240} \\ 2112 \\ \underline{1280} \\ 1056 \\ \underline{224} \end{array}$$

**153.**

15.004+, Ans.

$$\begin{array}{r} 72. ) 1080.290 \\ \end{array}$$

$$\begin{array}{r} 72 \\ \underline{360} \\ 360 \\ \underline{290} \\ 288 \\ \underline{2} \end{array}$$

**154.**

210, Ans.

$$\begin{array}{r} 375. ) 78750. \\ \end{array}$$

$$\begin{array}{r} 750 \\ \underline{375} \\ 375 \\ \underline{\phantom{0}} \\ 0 \end{array}$$

**MISCELLANEOUS EXERCISES.****155.** .0403  
400.0003**156.** 0.00567  
2.13007  
1.00157**157.** .0087  
.00162  
.000009

$$\mathbf{158.} \quad 4\frac{3}{8} + 1\frac{1}{8} = 4\frac{4}{8} + \frac{3}{8} = 4\frac{7}{8} = 5\frac{1}{8} = 5.325, \text{ Ans.}$$

$$\begin{array}{r}
 159. \quad 45.00000 \\
 36.00073 \\
 \hline
 8.99927, \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 160. \quad 25.7 \\
 8.389 \quad 58.000 \\
 23.056 \quad 57.145 \\
 \hline
 57.145 \quad \underline{.855}, \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 161. \quad 6346.0000 \\
 .6346 \\
 \hline
 6345.3654, \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 162. \quad 3\frac{3}{4} = 3.625 \\
 17\frac{1}{4} = 17.250 \\
 476 = 476.000 \\
 3.125 = 3.125 \\
 \hline
 500.000, \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 4.2000 \\
 .0042 \\
 \hline
 4.1958, \text{ Ans.}
 \end{array}$$

163.

$$.03125 = \frac{3125}{100000} = \frac{1}{32}, \text{ Ans.}$$

$$\begin{array}{r}
 .0000500 \\
 .0000005 \\
 \hline
 .0000495, \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 164. \quad 4 = 4.0000 \\
 2\frac{3}{4} = 2.7500 \\
 17 = 17.0000 \\
 .136 = .1360 \\
 .0408 = .0408 \\
 \hline
 23.9268, \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 165. \quad 365.250000 \\
 365.242264 \\
 \hline
 .007736 \\
 1880 \\
 \hline
 618880 \\
 61888 \\
 7736
 \end{array}$$

Ans. 14.543680 days.

$$\begin{array}{r}
 166 \quad 7423.973 \\
 .413 \\
 \hline
 7423.560
 \end{array}$$

612, Ans.

$$12|130.) \quad 742|3560.$$

$$\begin{array}{r}
 72780 \\
 \hline
 14556 \\
 12130 \\
 \hline
 24260 \\
 \hline
 24260
 \end{array}$$

$$\begin{array}{r}
 167. \quad \$ 7498.70 \\
 749.83 \\
 \hline
 \$ 6748.87
 \end{array}$$

$$\frac{1}{3} \text{ of } \$ 6748.87 = \$ 2249.62\frac{1}{3}, \text{ C's;}$$

$$\frac{1}{3} \text{ of } \$ 6748.87 = \$ 2249.62\frac{1}{3}, \text{ B's;}$$

$$\$ 2249.62\frac{1}{3} + 749.83 =$$

$$\$ 2999.45\frac{1}{3}, \text{ A's, Ans.}$$

$$168. 20.104 \times 5.07 = 101.92728$$

$$6.44 \div .005 = 1288$$

$$20004.$$

$$\quad 101.92728$$

$$\hline 20105.92728$$

$$\quad 1288.$$

$$\hline 18817.92728, \text{ Ans.}$$

$$169. 2\frac{3}{4} = 2.667$$

$$4\frac{3}{8} = 4.553$$

$$51.652 = 51.652$$

$$\hline 58.872, \text{ Ans.}$$

**170.**

$$\$ 968.4900$$

$$\$ 968.49 \times 3.4 = \$ 3292.8660$$

$$\$ 3292.866 \times 3.7 = \$ 12183.6042$$

$$\hline \$ 16444.9602, \text{ Ans.}$$

**171.**

$$4.9835, \text{ Ans.}$$

$$30 \overline{) 25} ) 15075.0000$$

$$\quad 12100$$

$$\hline 29750$$

$$\quad 27225$$

$$\hline 25250$$

$$\quad 24200$$

$$\hline 10500$$

$$\quad 9075$$

$$\hline 14250$$

$$\quad 12100$$

$$\hline 2150$$

**172.**

$$1 \div .01 = 100$$

$$.4 \times .0005 = .0002$$

$$.002 \times .0125 = .000025$$

$$.0002 + .000025 = .000225$$

$$.0009 \div .000225 = 4$$

$$100 - 4 = 96, \text{ Ans.}$$

$$173. \quad 6116.$$

$$\quad .027$$

$$\hline 42812$$

$$\quad 12232$$

$$\hline 165.132$$

$$\quad .003$$

$$\hline 165.135, \text{ Ans.}$$

174. 63 bushels. \$ 1.12, 1 bush. sold for.

$$)94.) 59 \overline{)22.}$$

$$\underline{564}$$

$$\underline{282}$$

$$\underline{282}$$

$$.63) 70.56$$

$$\underline{63}$$

$$\underline{75}$$

$$\underline{63}$$

$$\underline{126}$$

$$\underline{126}$$

$$\$ 1.12 - \$ 0.94 = \$ 0.18 \text{ gain, Ans.}$$

175.  $)9.) \$ 6 \overline{)6.6}$

$$\underline{\$ 7.4}$$

$$60.5$$

$$\underline{37 \ 0}$$

$$444$$

$$\underline{\$ 447.70, \text{ Ans.}}$$

176.  $.064 \overline{)3}$

$$\underline{.3}$$

$$\underline{.0194}$$

$$\underline{\$ 1728}$$

$$\underline{1552}$$

$$388$$

$$1358$$

$$\underline{194}$$

$$\underline{\$ 33.5232} = \$ 33 \frac{33}{100}, \text{ Ans.}$$

177.  $12.8 \div .16 = 80$

$$.128 \div .0016 = 80$$

$$\underline{80}$$

$$\underline{80} = 1, \text{ Ans.}$$

178.  $.012 \overline{)1} = \frac{1}{70}, \text{ Ans.}$

$$\underline{.840}$$

179.

$$\$ 3.75 \div .6875 = \$ 5 \frac{5}{11}, \text{ cost of 1 gal.}$$

$$40.25$$

$$\underline{\$ 5 \frac{5}{11}}$$

$$\underline{20125}$$

$$1829 \frac{5}{11}$$

$$\underline{\$ 219.54 \frac{5}{11}, \text{ Ans.}}$$

180.

$$\underline{\$ 15 \frac{7}{8}}$$

$$\underline{8}$$

$$\underline{\$ 127}, \text{ cost of 1 acre.}$$

$$46.78$$

$$\underline{1016}$$

$$889$$

$$762$$

$$\underline{508}$$

$$\underline{\$ 5941.06, \text{ Ans.}}$$

$$181. \$14.40 \div \$0.18\frac{2}{3} = 1440 \times \frac{6}{113} = \frac{8640}{113} = 76\frac{52}{113} \text{ lb., Ans.}$$

$$182. \quad 68\frac{31}{88} \text{ tons, Ans.}$$

$$\begin{array}{r} 35\overline{)84.} \quad 2458,60. \\ \underline{21504} \\ 30820 \\ \underline{28672} \\ 2148 \\ \underline{2148} \quad = 537 \\ 3584 = 896 \end{array}$$

$$183.$$

$$\begin{array}{r} 408. \quad 48\overline{)00.} \\ \underline{600, \text{ number.}} \\ .7 \\ \underline{420.0, \text{ Ans.}} \end{array}$$

$$184.$$

$$\begin{array}{r} .024 \\ .06 \\ \hline 00144. \end{array} \quad 4000, \text{ Ans.} \quad 5\overline{)76000.}$$

$$\begin{array}{r} 576 \\ \underline{\phantom{000}} \\ 000 \end{array}$$

$$185.$$

$$\left(\frac{5}{6} \div .33\frac{1}{3}\right) = \frac{5}{6} \times \frac{3}{1} = \frac{5}{2} = 2\frac{1}{2}$$

$$\left(.87\frac{1}{2} \div \frac{1}{8}\right) = \frac{7}{8} \times \frac{8}{1} = 7$$

$$7 \times 2\frac{1}{2} = 17\frac{1}{2}; \quad 7 - 2\frac{1}{2} = 4\frac{1}{2}$$

$$17\frac{1}{2} \div 4\frac{1}{2} = \frac{35}{2} \times \frac{2}{9} = \frac{35}{9} = 3\frac{8}{9}, \text{ Ans.}$$

### Article 154.

$$23. \$13.50$$

$$2.63$$

$$5.00$$

$$6.13$$

$$\$27.26, \text{ Ans.}$$

$$24. \$0.63$$

$$0.80$$

$$7.50$$

$$32.00$$

$$\$40.93, \text{ Ans.}$$

$$25.$$

$$\$6500.00$$

$$1356.85$$

$$\$5143.15, \text{ Ans.}$$

$$26. \$0.14$$

$$56$$

$$84$$

$$70$$

$$\$7.84$$

$$128$$

$$\$0.09$$

$$\$11.52$$

$$7.84$$

$$\$19.36, \text{ Ans.}$$

$$27.$$

$$\$0\overline{)19.} \quad \$47\overline{)50.}$$

$$38$$

$$\underline{95}$$

$$95$$

$$\underline{\phantom{00}}$$



<p>28. 491                      491</p> <p>    \$ 0.81                      29</p> <p>      <u>491</u>                      <u>462</u></p> <p>      3928                      \$ 0.95</p> <p>      <u>\$ 397.71</u>                      <u>2310</u></p> <p>                                    4158</p> <p>                                    <u>\$ 438.90</u></p> <p>                                    397.71</p> <p>                                    <u>\$ 41.19, Ans.</u></p>	<p>29. \$ 7975</p> <p>      <u>4560</u></p> <p>      \$ 3415, cost of land.</p> <p>                                    \$ 94.86+, Ans.</p> <p>36 ) \$ 3415.00</p> <p>      <u>324</u></p> <p>      <u>175</u></p> <p>      <u>144</u></p> <p>      <u>310</u></p> <p>      <u>288</u></p> <p>      <u>220</u></p> <p>      <u>216</u></p> <p>          4</p>
---	--

30.

<p>\$ 37.50                      \$ 63                      187</p> <p>      <u>187</u>                      <u>131</u>                      131</p> <p>      26250                      <u>63</u>                      318 acres.</p> <p>      30000                      189</p> <p>      <u>3753</u>                      <u>63</u></p> <p>      <u>\$ 7012.50</u>                      <u>\$ 8253</u></p> <p>      8253</p> <p>      <u>\$ 15265.50</u></p>	<p>                                    \$ 48.00+, Ans.</p> <p>318 ) \$ 15265.50</p> <p>      <u>1272</u></p> <p>      <u>2545</u></p> <p>      <u>2544</u></p> <p>      <u>150</u></p>
---	--

31. 4422, Ans.

\$ 0/67. ) \$ 29/70.

26 8

2 90

2 68

22

32. \$ 0/09. ) \$ 68/40.

7 60, Ans.

33.

7 ) \$ 26.25

\$ 3.75, cost of 1 bbl.

43.50

18750

      1125

      1500

\$ 163.1250, or \$ 163.12½, Ans.

## 34.

\$ 20.40	15.50 $\frac{1}{4}$ acres.	\$ 1040.98
35.45	20/50. ) 317/80.00	723.18
<u>10200</u>	205 0	<u>\$ 317.80</u>
8160	<u>112 80</u>	
10200	102 50	35.45
6120	<u>10 300</u>	15.50 $\frac{1}{4}$
<u>\$ 723.1800</u>	10 250	50.95 $\frac{1}{4}$ , Ans.
	<u>500</u>	
	<u>2050</u> = $\frac{10}{41}$	

## Article 156.

44. \$ 1.37 $\frac{1}{2}$ = \$ 1 + \$ $\frac{3}{8}$	45. \$ 0.66 $\frac{2}{3}$ = \$ $\frac{2}{3}$
\$ 144 = cost at \$ 1	28
54 = " $\frac{3}{8}$	$\frac{84}{8} \times \frac{2}{3} = \$ 56$ , Ans.
Ans. \$ 198 = " \$ 1 $\frac{3}{8}$	
46. \$ 3.87 $\frac{1}{2}$ = \$ 3 + \$ $\frac{7}{8}$	47. \$ 5.12 $\frac{1}{2}$ = \$ 5.125
\$ 60 = cost at \$ 1.	98 doz., Ans.
\$ 180.00 = cost at \$ 3	\$ 5/125. ) \$ 502/250.
52.50 = " $\frac{7}{8}$	<u>461 25</u>
Ans. \$ 232.50 = " \$ 3.87 $\frac{1}{2}$	<u>41 000</u>
	<u>41 000</u>
48. 18, Ans.	49. \$ 0.87 $\frac{1}{2}$ = \$ $\frac{7}{8}$
\$ 1/625. ) \$ 29/250.	7
16 25	$\frac{56}{8} \times \frac{7}{8} = \$ 49$ , Ans.
<u>13 000</u>	
<u>13 000</u>	

50.

$$\$2.25 = \$2 + \$\frac{1}{4}$$

$$\$302 = \text{earn at } \$1$$

$$\$604.00 = \text{earn at } \$2$$

$$75.50 = \text{ " } .25$$

$$\text{Ans. } \$679.50 = \text{ " } \$2.25$$

$$51. \$0.37\frac{1}{2} = \$0.375$$

$$2\ 117, \text{ Ans.}$$

$$\$0\overline{)375.} ) \$793\overline{)875.}$$

$$\begin{array}{r} 750 \\ \hline 438 \\ \hline 375 \\ \hline 637 \\ \hline 375 \\ \hline 2625 \\ \hline 2625 \\ \hline \end{array}$$

$$53. 1360 = 13.60 \text{ hund. ; } \$0.37\frac{1}{2} = \$\frac{3}{8}; \cancel{13.60}^{\overline{1.70}} \times \frac{3}{8} =$$

$$\$5.10, \text{ Ans.}$$

$$54. 650 = 6.50, \text{ or } 6\frac{1}{2} \text{ hundreds ; } 6\frac{1}{2} \times \$12.50 = \$81.25, \text{ Ans.}$$

$$56. 5650 = 5.65 \text{ M. ; } 5.65 \times \$44 = \$248.60, \text{ Ans.}$$

$$57. 4565 = 4.565 \text{ M. ; } 4.565 \times \$23 = \$104.995$$

$$13640 = 13.64 \text{ M. ; } 13.64 \times \$53.55 = \$730.422$$

$$15250 = 15\frac{1}{2} \text{ thousands ; } 15\frac{1}{2} \times \$4.50 = \$68.625$$

$$\$104.995$$

$$730.422$$

$$68.625$$

$$\$904.042, \text{ Ans.}$$

$$59. 8375 = 8.375 \text{ M. ; } \$100.50 \div 8.375 = \$12, \text{ Ans.}$$

$$60. 650 = 6.50, \text{ or } 6\frac{1}{2} \text{ hundreds ; } \$81.25 \div 6\frac{1}{2} = \$12.50, \text{ Ans.}$$

$$61. \quad \$30, \text{ sold 1 acre for.} \quad \$31.50$$

$$75.8 ) \$2274.0$$

$$\begin{array}{r} 2274 \\ \hline 0 \end{array}$$

$$30$$

$$\text{Ans. } \$1.50, \text{ loss per acre.}$$

**Article 159.****62.****HENRY OTIS,**In Account with **JAMES DELANY, Dr.**

1881.

Jan. 3	To 1 bbl. Molasses, 44 gal. ....@ 55¢.....	\$ 24 20
" "	" 100 lb. Carolina Rice ..... " 7 ¢.....	7 00
Feb. 8	" 50 lb. Mocha Coffee ..... " 28 ¢.....	14 00
Mar. 17	" 1 bbl. Sugar, 328 lb. .... " 9 ¢.....	29 52
Apr. 22	" 1 box Tea, 35 lb. .... " 45 ¢.....	15 75
		<b>\$ 90.47</b>

**63.***New York, May 16, 1881.***MR. JAMES COOPER,**Bought of **ARTHUR GILMAN & Co.**

5 bbl. Clear Pork .....	@	\$ 20.50.....	\$ 102	50
3 bbl. New Mess Beef .....	"	12.50.....	37	50
2 bbl. Lard, 421 lb. ....	"	0.11.....	46	31
364 lb. Smoked Ham .....	"	0.10.....	36	40
			\$ 222 71	

*Received Payment,***ARTHUR GILMAN & Co.****64.***Providence, June 11, 1881.***MR. WILLIAM BAKER,**To **JOHN O'BRIEN, Dr.**

To 6 days' Labor.....@	\$ 2.50.....	\$ 15 00
“ 6 days' Labor of Boy.....“	1.25.....	7 50
“ 2 bbl. Rockland Lime ....“	0.95.....	1 90
“ 3450 Bricks, per M. ....“	12.00.....	41 40
“ Carting .....“	2.75.....	2 75
		<hr/>
		\$ 68 55
Cr.		
By 1 Month's Rent .....	\$ 10.00.....	10 00
		<hr/>
		\$ 58.55

*Received Payment,***JOHN O'BRIEN,***By* **PETER O'BRIEN.**

65.

*Burlington, July 19, 1881.*

MR. GEORGE ALLEN,

Bought of ALBERT LANE &amp; SONS.

1881.

May 9	61 yd. American Prints .....	@ 7¢.....	\$ 4 27
" 11	84 yd. Avon Sheeting .....	" 8¢.....	6 72
" 13	94 yd. Samoset Ticking .....	" 19¢.....	17 86
June 7	10 doz. Merino Hose .....	" \$ 2.24.....	22 40
" 11	83 yd. Prints .....	" 6¢.....	4 98
			\$ 56.23

*Paid, July 21, 1881,*

ALBERT LANE &amp; SONS.

66.

*New Orleans, July 1, 1882.*

HARLAN, JONES, &amp; Co.,

In Account with FELIX REMOND, Dr.

1882.

June 3	15 bbl. N. P. Flour .....	@ \$ 8.25.....	\$ 123 75
" 5	10 bbl. St. Louis Flour.....	" 7.40.....	74 00
" 9	3 tubs Butter, 121 lb.....	" .30.....	36 30
" 15	125 lb. Smoked Ham.....	" .10.....	12 50
" 25	43 lb. Cheese.....	" .11.....	4 73
			251 28
Cr.			
" 9	Merchandise .....	\$ 96.50	
" 15	Cash .....	50.00	146 50
Balance due F. R.....			\$ 104.78

*Received Payment, July 3, 1882,*

FELIX REMOND.

67.

*Trenton, Oct. 3, 1881.*

ANDREW SHAW,

Bought of INGRAM, SMITH, &amp; Co.

25 pairs	Kip Boots .....	@ \$ 2.50...	\$ 62 50
20 "	Calf Boots .....	" 2.75...	55 00
30 "	New Brunswick Rub. Boots ..	" 3.00...	90 00
15 "	Kip Brogan Shoes .....	" 1.25...	18 75
Carting .....			25
			\$ 226.50

68.

St. Paul, Sept. 15, 1881.

JACOB VAN HUSEN,

Bought of HOOPER, BLAKE, &amp; DUDLEY.

100 bbl. Best Test Patent Flour @ \$ 8.25...	\$ 825	00
50 bbl. Wilbur's Extra Flour..... " 6.50...	325	00
Freight .....	6	25
	\$ 1156.25	

*Received Payment,*

HOOPER, BLAKE, &amp; DUDLEY.

69.

June 1, 1881.

JOSEPH McINTIRE,

To ..... Dr.

To Services, 3 months .....@ \$ 28.....\$ 84.00

*Received Payment,*

70.

Chicago, Nov. 1, 1882.

WILLIAM ASBURY,

In Account with GEORGE W. OGDEN &amp; BRO.

1881.

Oct. 2	To 50 tons Franklin Coal .....@ \$ 5.25...	\$ 262	50
" 10	" 75 " Cumberland Coal ... " 4.75...	356	25
" 16	" 25 cords Pine Wood ..... " 4.75...	118	75
		737	50
	Cr.		
" 10	By Cash ..... \$ 262.50		
" 20	" Merchandise ..... 31.65	294	15
		\$ 443.35	

*Received Payment,*

GEORGE W. OGDEN &amp; BROTHER.

## 71.

Nov. 10, 1881.

ARTHUR ROBERTS,

Bought of JORDAN, MARSH, &amp; Co.

64½ yd. Tapestry Carpet .....	@	87½¢...	\$ 56	44
27 " Brussels Carpet .....	"	\$ 1.85...	49	95
18½ " Oilcloth .....	"	37½¢...	7	03
Making and laying .....			13	22
			\$ 126.64	

## Article 187.

13. 19 bu. 3 pk. 7 qt. 1 pt.

$$\begin{array}{r}
 4 \\
 79 \text{ pk.} \\
 8 \\
 \hline
 639 \text{ qt.} \\
 2 \\
 \hline
 \text{Ans. } 1279 \text{ pt.}
 \end{array}$$

14. 48 cu. yd. 15 cu. ft.

$$\begin{array}{r}
 27 \\
 351 \\
 96 \\
 \hline
 \text{Ans. } 1311 \text{ cu. ft.}
 \end{array}$$

15. 17 T. 17 cwt. 90 lb.

$$\begin{array}{r}
 20 \\
 357 \text{ cwt.} \\
 100 \\
 \hline
 \text{Ans. } 35790 \text{ lb.}
 \end{array}$$

## Article 188.

16.

$$\begin{array}{r}
 12 \text{ A. } 144 \text{ sq. rd. } 144 \text{ sq. ft.} \\
 160 \\
 864 \\
 12 \\
 \hline
 2064 \text{ sq. rd.} \\
 272\frac{1}{2} \\
 4272 \\
 14448 \\
 4128 \\
 516 \\
 \hline
 \text{Ans. } 562068 \text{ sq. ft.}
 \end{array}$$

17.

$$\begin{array}{r}
 5 \text{ cu. yd. } 23 \text{ cu. ft. } 725 \text{ cu. in.} \\
 27 \\
 38 \\
 12 \\
 \hline
 158 \text{ cu. ft.} \\
 1728 \\
 1264 \\
 316 \\
 1106 \\
 158725 \\
 \hline
 \text{Ans. } 273749 \text{ cu. in.}
 \end{array}$$

**18.** 60 gal. 3 qt. 1 pt.

$$\begin{array}{r}
 4 \\
 243 \text{ qt.} \\
 2 \\
 \hline
 \text{Ans. } 487 \text{ pt.}
 \end{array}$$

**19.** 13 bu. 2 pk. 7 qt. 1 pt.

$$\begin{array}{r}
 4 \\
 54 \text{ pk.} \\
 8 \\
 \hline
 439 \text{ qt.} \\
 2 \\
 \hline
 \text{Ans. } 879 \text{ pt.}
 \end{array}$$

**20.** 47 mi.

$$\begin{array}{r}
 320 \\
 940 \\
 141 \\
 \hline
 15040 \text{ rd.} \\
 16\frac{1}{2} \\
 \hline
 90240 \\
 15040 \\
 7520 \\
 \hline
 \text{Ans. } 248160 \text{ ft.}
 \end{array}$$

**21.** 72 lb. 10 oz. 15 pwt. 7 gr.

$$\begin{array}{r}
 12 \\
 874 \text{ oz.} \\
 20 \\
 \hline
 17495 \text{ pwt.} \\
 24 \\
 \hline
 69987 \\
 34990 \\
 \hline
 \text{Ans. } 419887 \text{ gr.}
 \end{array}$$

**22.**

$$\begin{array}{r}
 43 \text{ T. } 13 \text{ cwt. } 20 \text{ lb.} \\
 20 \\
 \hline
 873 \text{ cwt.} \\
 100 \\
 \hline
 \text{Ans. } 87320 \text{ lb.}
 \end{array}$$

**23.** 365 d. 5 h. 48 m. 50 sec.

$$\begin{array}{r}
 24 \\
 1465 \\
 730 \\
 \hline
 8765 \text{ h.} \\
 60 \\
 \hline
 525948 \text{ m.} \\
 60 \\
 \hline
 \text{Ans. } 31556930 \text{ sec.}
 \end{array}$$

**24.** 8 cu. yd. 10 cu. ft. 728 cu. in.

$$\begin{array}{r}
 27 \\
 56 \\
 17 \\
 \hline
 226 \text{ cu. ft.} \\
 1728 \\
 2536 \\
 452 \\
 1582 \\
 226 \\
 \hline
 \text{Ans. } 391256 \text{ cu. in.}
 \end{array}$$

**25.**

$$\begin{array}{r}
 45^\circ 28' 54'' \\
 60 \\
 \hline
 2728' \\
 60 \\
 \hline
 \text{Ans. } 163734''
 \end{array}$$



26. 25 cd.

128

200

50

25

Ans. 3200 cu. ft.

27. 40 gal. 3 qt. 0 pt. 2 gi.

4

163 qt.

2

326 pt.

4

Ans. 1306 gi.

28. 67 wk. 6 d. 9 h. 52 min.

7

475 d.

24

1900

9509

11409 h.

60

Ans. 684592 min.

29. 4 bundles 1 ream

2

9 reams

20

180 quires

24

720

360

Ans. 4320 sheets.

30. 1 A. 80 sq. rd.

160

240 sq. rd.272 $\frac{1}{2}$ 480

1680

48060

65340 sq. ft.\$ 0.05  $\times$  65340 = \$ 3267, Ans.

31. 3 mi. 195 rd.

320

960

195

1155 rd.\$ 5.50  $\times$  1155 = \$ 6352.50, Ans

33.

1 mi. = 1760 yd. ;  $\frac{1}{20}$  mi. =  $\frac{1}{20}$  of <sup>88</sup>~~1760~~ yd. = 88 yd., Ans.

34.

1 lb. = 5760 gr. ;  $\frac{1}{360}$  lb. =  $\frac{1}{360}$  of <sup>2</sup>~~5760~~ gr. =  $\frac{2}{3}$  gr., Ans.

**35.**

$$1 \text{ d.} = 86400 \text{ sec.}; \text{ } \cancel{86400} \text{ d.} = \frac{1}{\cancel{86400} \atop 28} \text{ of } \cancel{86400} \text{ sec.} = \frac{27}{28} \text{ sec., Ans.}$$

$$36. \quad 1 \text{ gal.} = 32 \text{ gi.}; \text{ } \cancel{7} \text{ gal.} = \frac{7}{\cancel{288} \atop 9} \text{ of } \cancel{32} \text{ gi.} = \frac{7}{9} \text{ gi., Ans.}$$

$$37. \quad 1 \text{ bushel} = 32 \text{ quarts};$$

$$\frac{2}{15} \text{ bu.} = \frac{2}{15} \text{ of } 32 \text{ qt.} = \frac{64}{15} = 4\frac{4}{15} \text{ qt., Ans.}$$

$$39. \quad .024 \text{ ton}$$

$$\text{Ans. } \frac{2000}{48.000} \text{ lb.}$$

$$40. \quad .0075 \text{ A.}$$

$$41. \quad .3945 \text{ d.}$$

$$42. \quad 1.364 \text{ A.}$$

$$\begin{array}{r} 160 \\ \hline 4500 \\ 75 \\ \hline 1.2000 \text{ sq. rd.} \end{array}$$

$$\begin{array}{r} 24 \\ \hline 15780 \\ 7890 \\ \hline 9.4680 \text{ h.} \end{array}$$

$$\begin{array}{r} 160 \\ \hline 81840 \\ 1364 \\ \hline 218.240 \text{ sq. rd.} \end{array}$$

$$\begin{array}{r} 272\frac{1}{4} \\ \hline 24000 \end{array}$$

$$\begin{array}{r} 60 \\ \hline \text{Ans. } 568.0800 \text{ min.} \end{array}$$

$$\begin{array}{r} 30\frac{1}{4} \\ \hline 6547200 \end{array}$$

$$84000$$

$$24000$$

$$3000$$

$$\text{Ans. } 326.7000 \text{ sq. ft.}$$

$$54560$$

$$\text{Ans. } 6601.760 \text{ sq. yd.}$$

**Article 189.**

$$51. \quad 2) 1279 \text{ pt.}$$

$$52. \quad 27) 1311 \text{ cu. ft.}$$

$$8) \overline{639} + 1 \text{ pt.}$$

$$\overline{48} + 15 \text{ cu. ft.}$$

$$4) \overline{79} + 7 \text{ qt.}$$

$$\text{Ans. } 48 \text{ cu. yd. } 15 \text{ cu. ft.}$$

$$\overline{19} + 3 \text{ pk.}$$

$$\text{Ans. } 19 \text{ bu. } 3 \text{ pk. } 7 \text{ qt. } 1 \text{ pt.}$$

$$53. \quad 100) 35790 \text{ lb.}$$

$$20) \overline{357} + 90 \text{ lb.}$$

$$\overline{17} \text{ T.} + 17 \text{ cwt.}$$

$$\text{Ans. } 17 \text{ T. } 17 \text{ cwt. } 90 \text{ lb.}$$

**Article 190.**

$$54. \quad 272\frac{1}{4} \overline{) 562068} \text{ sq. ft.}$$

$$\begin{array}{r} 4 \phantom{0000} \\ 1089 \overline{) 2248272} \end{array}$$

$$160 \overline{) 2064} \text{ sq. rd. } 12\frac{1}{2} \text{ or } 144 \text{ sq. ft.}$$

$$12 \text{ A. } 144 \text{ sq. rd.}$$

$$\text{Ans. } 12 \text{ A. } 144 \text{ sq. rd. } 144 \text{ sq. ft.}$$

$$55. \quad 1728 \overline{) 273749} \text{ cu. in.}$$

$$27 \overline{) 158} \text{ cu. ft. } 725 \text{ cu. in.}$$

$$5 \text{ cu. yd. } 23 \text{ cu. ft.}$$

$$\text{Ans. } 5 \text{ cu. yd. } 23 \text{ cu. ft. } 725 \text{ cu. in.}$$

$$56. \quad 2 \overline{) 487} \text{ pt.}$$

$$4 \overline{) 243} \text{ qt. } 1 \text{ pt.}$$

$$60 \text{ gal. } 3 \text{ qt.}$$

$$\text{Ans. } 60 \text{ gal. } 3 \text{ qt. } 1 \text{ pt.}$$

$$57. \quad 2 \overline{) 879} \text{ pt.}$$

$$8 \overline{) 439} \text{ qt. } 1 \text{ pt.}$$

$$4 \overline{) 54} \text{ pk. } 7 \text{ qt.}$$

$$13 \text{ bu. } 2 \text{ pk.}$$

$$\text{Ans. } 13 \text{ bu. } 2 \text{ pk. } 7 \text{ qt. } 1 \text{ pt.}$$

$$58. \quad 16\frac{1}{2} \overline{) 248160} \text{ ft.}$$

$$2 \phantom{0000} \\ 33 \overline{) 496320}$$

$$320 \overline{) 15040} \text{ rd.}$$

$$\text{Ans. } 47 \text{ mi.}$$

$$59. \quad 24 \overline{) 419887} \text{ gr.}$$

$$20 \overline{) 17495} \text{ pwt. } 7 \text{ gr.}$$

$$12 \overline{) 874} \text{ oz. } 15 \text{ pwt.}$$

$$72 \text{ lb. } 10 \text{ oz.}$$

$$\text{Ans. } 72 \text{ lb. } 10 \text{ oz. } 15 \text{ pwt. } 7 \text{ gr.}$$

$$60. \quad 100 \overline{) 87320} \text{ lb.}$$

$$20 \overline{) 873} \text{ cwt. } 20 \text{ lb.}$$

$$43 \text{ T. } 13 \text{ cwt.}$$

$$\text{Ans. } 43 \text{ T. } 13 \text{ cwt. } 20 \text{ lb.}$$

$$61. \quad 60 \overline{) 31556930} \text{ sec.}$$

$$60 \overline{) 525948} \text{ min. } 50 \text{ sec.}$$

$$24 \overline{) 8765} \text{ h. } 48 \text{ min.}$$

$$365 \text{ d. } 5 \text{ h.}$$

$$\text{Ans. } 365 \text{ d. } 5 \text{ h. } 48 \text{ min. } 50 \text{ sec.}$$

$$62. 1728 \overline{) 391256} \text{ cu. in.}$$

$$27 \overline{) 226} \text{ cu. ft. } 728 \text{ cu. in.}$$

$$8 \text{ cu. yd. } 10 \text{ cu. ft.}$$

$$\text{Ans. } 8 \text{ cu. yd. } 10 \text{ cu. ft. } 728 \text{ cu. in.}$$

$$63. 60 \overline{) 163734''}$$

$$60 \overline{) 2728'} 54''$$

$$45^\circ 28'$$

$$\text{Ans. } 45^\circ 28' 54''.$$

$$64. 128 \overline{) 3200} \text{ cu. ft.}$$

$$\text{Ans. } 25 \text{ cu.}$$

$$65. 4 \overline{) 1306} \text{ gi.}$$

$$2 \overline{) 326} \text{ pt. } 2 \text{ gi.}$$

$$4 \overline{) 163} \text{ qt.}$$

$$40 \text{ gal. } 3 \text{ qt.}$$

$$\text{Ans. } 40 \text{ gal. } 3 \text{ qt. } 0 \text{ pt. } 2 \text{ gi.}$$

$$66. 60 \overline{) 684592} \text{ min.}$$

$$24 \overline{) 11409} \text{ h. } 52 \text{ min.}$$

$$7 \overline{) 475} \text{ d. } 9 \text{ h.}$$

$$67 \text{ w. } 6 \text{ d.}$$

$$\text{Ans. } 67 \text{ w. } 6 \text{ d. } 9 \text{ h. } 52 \text{ min.}$$

$$67. 24 \overline{) 4320} \text{ sheets.}$$

$$20 \overline{) 180} \text{ quires.}$$

$$2 \overline{) 9} \text{ reams.}$$

$$4 \text{ bundles } 1 \text{ ream.}$$

$$\text{Ans. } 4 \text{ bundles } 1 \text{ ream.}$$

$$68. .05 \overline{) 3267.00}$$

$$272\frac{1}{4} \overline{) 65340} \text{ sq. ft.}$$

$$4 \overline{) 4}$$

$$1089 \overline{) 261360}$$

$$160 \overline{) 240} \text{ sq. rd.}$$

$$\text{Ans. } 1 \text{ A. } 80 \text{ sq. rd.}$$

69.

$$5.50 \overline{) 6352.50}$$

$$320 \overline{) 1155} \text{ rd.}$$

$$\text{Ans. } 3 \text{ mi. } 195 \text{ rd.}$$

$$71. 1 \text{ mi.} = 1760 \text{ yd. } 1 \text{ yd.} = \frac{1}{1760} \text{ mi.}$$

$$88 \text{ yd.} = 88 \times \frac{1}{1760} \text{ mi.} = \frac{1}{20} \text{ mi., Ans.}$$

$$72. 1 \text{ lb.} = 5760 \text{ gr. } 1 \text{ gr.} = \frac{1}{5760} \text{ lb.}$$

$$3000 \text{ gr.} = 3000 \times \frac{1}{5760} \text{ lb.} = \frac{25}{48} \text{ lb., Ans.}$$

73. 1 day = 86400 sec. 1 sec. =  $\frac{1}{86400}$  day.

$$12600 \text{ sec.} = \cancel{12600}^7 \times \frac{1}{\cancel{86400}_{48}} \text{ day} = \frac{7}{48} \text{ day, Ans.}$$

74. 1 gal. = 32 gi. 1 gi. =  $\frac{1}{32}$  gal.

$$24 \text{ gi.} = \cancel{24}^3 \times \frac{1}{\cancel{32}_4} \text{ gal.} = \frac{3}{4} \text{ gal., Ans.}$$

75. 1 bu. = 32 qt. 1 qt. =  $\frac{1}{32}$  bu.

$$4\frac{4}{15} \text{ qt.} = 4\frac{4}{15} \times \frac{1}{32} \text{ bu.} = \frac{\cancel{64}^2}{15} \times \frac{1}{\cancel{32}_2} = \frac{2}{15} \text{ bu., Ans.}$$

77.  $2000 \overline{) 48.000} \text{ lb.}$   
Ans. .024 T.

78.  $272\frac{1}{4} \overline{) 326.7} \text{ sq. ft.}$   
 $\begin{array}{r} 4 \phantom{00} \\ 1089 \overline{) 1306.8} \end{array}$

79.  $60 \overline{) 568.080} \text{ min.}$   
 $24 \overline{) 9.468} \text{ h.}$   
Ans. .3945 d.

$160 \overline{) 1.2000} \text{ sq. rd.}$   
Ans. .0075 A.

80.  $30\frac{1}{4} \overline{) 6601.76} \text{ sq. yd.}$   
 $\begin{array}{r} 4 \phantom{00} \\ 121 \overline{) 26407.04} \end{array}$

$160 \overline{) 218.240} \text{ sq. rd.}$   
Ans. 1.364 A.

### Article 191.

83.  $\frac{3}{8} \text{ mi.} = \frac{2}{9} \text{ of } 320 \text{ rd.} = 71\frac{1}{3} \text{ rd.}$

$\frac{1}{3} \text{ rd.} = \frac{1}{9} \text{ of } 16\frac{1}{2} \text{ ft.} = 1\frac{2}{3} \text{ ft.}$

$\frac{2}{3} \text{ ft.} = \frac{5}{6} \text{ of } \cancel{12}^2 \text{ in.} = 10 \text{ in.}$

Ans. 71 rd. 1 ft. 10 in.

90. .53 rd. = .53 of  $5\frac{1}{2}$  yd. = 2.915 yd.  
 .915 yd. = .915 of 3 ft. = 2.745 ft.  
 .745 ft. = .745 of 12 in. = 8.94 in.

Ans. 2 yd. 2 ft. 8.94 in.

### Article 192

91.  $\frac{3}{7}$  A. =  $\frac{3}{7}$  of 160 sq. rd. =  $68\frac{2}{7}$  sq. rd.  
 $\frac{4}{7}$  sq. rd. =  $\frac{4}{7}$  of  $272\frac{1}{2}$  sq. ft. =  $155\frac{4}{7}$  sq. ft.  
 $\frac{4}{7}$  sq. ft. =  $\frac{4}{7}$  of 144 sq. in. =  $82\frac{2}{7}$  sq. in.

Ans. 68 sq. rd. 155 sq. ft.  $82\frac{2}{7}$  sq. in.

92.  $\frac{8}{9}$  lb. =  $\frac{8}{9}$  of 12 oz. =  $10\frac{2}{3}$  oz.  
 $\frac{2}{3}$  oz. =  $\frac{2}{3}$  of 20 pwt. =  $13\frac{1}{3}$  pwt.  
 $\frac{1}{3}$  pwt. =  $\frac{1}{3}$  of 24 gr. = 8 gr.

Ans. 10 oz. 13 pwt. 8 gr.

93.  $\frac{7}{11}$  y. =  $\frac{7}{11}$  of 365 d. =  $232\frac{2}{11}$  d.  
 $\frac{3}{11}$  d. =  $\frac{3}{11}$  of 24 h. =  $6\frac{6}{11}$  h.  
 $\frac{6}{11}$  h. =  $\frac{6}{11}$  of 60 min. =  $32\frac{4}{11}$  min.  
 $\frac{8}{11}$  min. =  $\frac{8}{11}$  of 60 sec. =  $43\frac{7}{11}$  sec.

Ans. 232 d. 6 h. 32 min.  $43\frac{7}{11}$  sec.

$$94. \quad \frac{7}{9} \text{ mi.} = \frac{7}{9} \text{ of } 320 \text{ rd.} = 248\frac{8}{9} \text{ rd.}$$

$$\frac{8}{9} \text{ rd.} = \frac{8}{9} \text{ of } 5\frac{1}{2} \text{ yd.} = 4\frac{8}{9} \text{ yd.}$$

$$\frac{8}{9} \text{ yd.} = \frac{8}{9} \text{ of } 3 \text{ ft.} = 2\frac{8}{9} \text{ ft.}$$

$$\frac{2}{3} \text{ ft.} = \frac{2}{3} \text{ of } 12 \text{ in.} = 8 \text{ in.}$$

Ans. 248 rd. 4 yd. 2 ft. 8 in.

$$95. \quad .6725 \text{ cental} = .6725 \text{ of } 100 \text{ lb.} = 67.25 \text{ lb.}$$

$$.25 \text{ lb.} = .25 \text{ of } 16 \text{ oz.} = 4 \text{ oz.}$$

Ans. 67 lb. 4 oz.

$$96. \quad .282 \text{ T.} = .282 \text{ of } 20 \text{ cwt.} = 5.64 \text{ cwt.}$$

$$.64 \text{ cwt.} = .64 \text{ of } 100 \text{ lb.} = 64 \text{ lb.}$$

Ans. 5 cwt. 64 lb.

$$97. \quad .875 \text{ rd.} = .875 \text{ of } 5\frac{1}{2} \text{ yd.} = 4.8125 \text{ yd.}$$

$$.8125 \text{ yd.} = .8125 \text{ of } 3 \text{ ft.} = 2.4375 \text{ ft.}$$

$$.4375 \text{ ft.} = .4375 \text{ of } 12 \text{ in.} = 5.25 \text{ in.}$$

Ans. 4 yd. 2 ft. 5.25 in.

$$98. \quad .761 \text{ d.} = .761 \text{ of } 24 \text{ h.} = 18.264 \text{ h.}$$

$$.264 \text{ h.} = .264 \text{ of } 60 \text{ min.} = 15.84 \text{ min.}$$

$$.84 \text{ min.} = .84 \text{ of } 60 \text{ sec.} = 50.4 \text{ sec.}$$

Ans. 18 h. 15 min. 50.4 sec.

$$107. \quad 10 \text{ in.} = 10 \div 12 = \frac{5}{6} \text{ ft.}$$

$$1\frac{1}{2} \text{ ft.} = \frac{11}{6} \div 16\frac{1}{2} = \frac{1}{9} \text{ rd.}$$

$$71\frac{1}{9} \text{ rd.} = \frac{640}{9} \div 320 = \frac{2}{9} \text{ mi., Ans.}$$

109.  $8.94 \text{ in.} = 8.94 \div 12 = .745 \text{ ft.}$   
 $2.745 \text{ ft.} = 2.745 \div 3 = .915 \text{ yd.}$   
 $2.915 \text{ yd.} = 2.915 \div 5\frac{1}{2} = .53 \text{ rd., Ans.}$

**Article 193.**

110.  $155 \text{ sq. ft.} = 155 \div 272\frac{1}{4} = \frac{620}{1089} \text{ sq. rd.}$   
 $68\frac{420}{1089} \text{ sq. rd.} = 68\frac{420}{1089} \div 160 = \frac{4667}{10890} \text{ A., Ans.}$
111.  $8 \text{ gr.} = 8 \div 24 = \frac{1}{3} \text{ pwt.}$   
 $13\frac{1}{3} \text{ pwt.} = \frac{40}{3} \div 20 = \frac{2}{3} \text{ oz.}$   
 $10\frac{2}{3} \text{ oz.} = \frac{32}{3} \div 12 = \frac{8}{9} \text{ lb., Ans.}$
112.  $21 \text{ min.} = 21 \div 60 = \frac{7}{20} \text{ h.}$   
 $10\frac{7}{20} \text{ h.} = 10\frac{7}{20} \div 24 = \frac{207}{480} \text{ d,}$   
 $232\frac{207}{480} \text{ d.} = \frac{111567}{480} \div 365 = \frac{37189}{58400} \text{ y., Ans.}$
113.  $8 \text{ in.} = 8 \div 12 = \frac{2}{3} \text{ ft.}$   
 $2\frac{2}{3} \text{ ft.} = \frac{8}{3} \div 3 = \frac{8}{9} \text{ yd.}$   
 $4\frac{8}{9} \text{ yd.} = \frac{44}{9} \div 5\frac{1}{2} = \frac{8}{9} \text{ rd.}$   
 $248\frac{8}{9} \text{ rd.} = \frac{2240}{9} \div 320 = \frac{7}{9} \text{ mi., Ans.}$



- 114.**  $4 \text{ oz.} = 4 \div 16 = .25 \text{ lb.}$   
 $67.25 = 67.25 \div 100 = .6725 \text{ cental, Ans.}$
- 115.**  $64 \text{ lb.} = 64 \div 100 = .64 \text{ cwt.}$   
 $5.64 \text{ cwt.} = 5.64 \div 20 = .282 \text{ T., Ans.}$
- 116.**  $5.25 \text{ in.} = 5.25 \div 12 = .4375 \text{ ft.}$   
 $2.4375 \text{ ft.} = 2.4375 \div 3 = .8125 \text{ yd.}$   
 $4.8125 \text{ yd.} = 4.8125 \div 5\frac{1}{2} = .875 \text{ rd., Ans.}$
- 117.**  $50.4 \text{ sec.} = 50.4 \div 60 = .84 \text{ min.}$   
 $15.84 \text{ min.} = 15.84 \div 60 = .264 \text{ h.}$   
 $18.264 \text{ h.} = 18.264 \div 24 = .761 \text{ d., Ans.}$

**Article 194.**

- 118.**  $2 \text{ A. } 112 \text{ sq. rd.} = 432 \text{ sq. rd.}$       $\frac{144}{432} = \frac{1}{3}, \text{ Ans.}$   
 $144 \text{ sq. rd.} = 144 \text{ sq. rd.}$
- 119.**  $3 \text{ mi. } 120 \text{ rd. } 4 \text{ yd.} = 5944 \text{ yd.}$       $\frac{4183}{5944}, \text{ Ans.}$   
 $2 \text{ mi. } 120 \text{ rd. } 3 \text{ yd.} = 4183 \text{ yd.}$

**120.**

- $1 \text{ lb. } 4 \text{ oz. } 12 \text{ pwt. } 12 \text{ gr.} = 7980 \text{ gr.}$   
 $5 \text{ oz. } 10 \text{ pwt.} = 2640 \text{ gr.}$
- $\frac{2640}{7980} = \frac{44}{133}, \text{ Ans.}$

**121.**

- $74 \text{ mi. } 80 \text{ rd.} = 23760 \text{ rd.}$   
 $9 \text{ mi. } 90 \text{ rd.} = 2970 \text{ rd.}$
- $\frac{2970}{23760} = \frac{1}{8} = .125, \text{ Ans.}$
- 122.**  $7 \text{ bu. } 1 \text{ pk. } 5 \text{ qt.} = 237 \text{ qt.}$   
 $82 \text{ bu. } 3 \text{ pk. } 1 \text{ qt.} = 2649 \text{ qt.}$
- $\frac{2649}{237} = \frac{883}{79} = 11.174\frac{1}{2}, \text{ Ans.}$

**Article 195.****126.**

63 cu. yd. 11 cu. ft. 842 cu. in.

**128.**

77 d. 8 h. 26 min. 56 sec.

**127.** 199 gal. 1 qt.**129.**  $64^{\circ} 28' 32''$ .**131.** $\frac{7}{11}$  T. = 12 cwt.  $72\frac{8}{11}$  lb. $\frac{1}{2}\frac{1}{2}$  ctl. =  $77\frac{3}{11}$ 

1 T. 2 3

Ans. 1 T. 15 cwt. 53 lb.

**132.** $60\frac{3}{4}$  mi. = 60 mi. 240 rd.

50 120

 $56\frac{1}{2}$  mi. = 56 200

Ans. 167 mi. 240 rd.

**133.**  $\frac{4}{7}$  A. =  $114\frac{2}{7}$  sq. rd. $\frac{3}{4}$  A. =  $106\frac{3}{4}$  $\frac{1}{2}\frac{3}{4}$  A. =  $148\frac{3}{4}$ Ans. 2 A.  $49\frac{1}{2}\frac{1}{4}$  sq. rd.**135.** 73 bu. 2 pk. 5 qt.

59 3 7

Ans. 13 bu. 2 pk. 6 qt.

**136.** 17 mi. 311 rd. 1 yd. 1 ft. 3 in.

3 79 1 2 7

Ans. 14 mi. 231 rd.  $4\frac{1}{2}$  yd. 1 ft. 8 in.

Or,

14 mi. 231 rd. 5 yd. 0 ft. 2 in.

**137.**

116 A. 53 sq. rd. 100 sq. ft. 113 sq. in.

87 137 100 113

Ans. 28 A. 76 sq. rd. 0 sq. ft. 0 sq. in.

**138.** $87^{\circ} 35' 0''$ 

71 4 9

Ans.  $16^{\circ} 30' 51''$ **139.** $\frac{1}{8}$  lb. = 7 oz. 6 pwt. 16 gr.

2 0 19.2

Ans. 5 oz. 5 pwt. 20.8 gr.

**140.**

1 hhd. = 63 gal. 0 qt. 0 pt. 0 gi.

 $\frac{4}{5}$  hhd. = 50 1 1  $0\frac{4}{5}$ Ans. 12 gal. 2 qt. 0 pt.  $3\frac{1}{5}$  gi.

$$\begin{array}{rcl}
 141. & .367 \text{ y.} & = 133 \text{ d. } 22 \text{ h. } 55 \text{ min. } 12 \text{ sec.} \\
 & .761 \text{ d.} & = \quad 18 \quad 15 \quad 50.4 \\
 & \text{Ans.} & \underline{133 \text{ d. } 4 \text{ h. } 39 \text{ min. } 21.6 \text{ sec.}}
 \end{array}$$

$$\begin{array}{rcl}
 142. & .7895 \text{ mi.} & = 252 \text{ rd. } 3 \text{ yd. } 1 \text{ ft. } 6.72 \text{ in.} \\
 & \frac{3}{4} \text{ mi.} & = \quad 71 \quad 0 \quad 1 \quad 10 \\
 & \text{Ans.} & \underline{181 \text{ rd. } 2 \text{ yd. } 2 \text{ ft. } 8.72 \text{ in.}}
 \end{array}$$

**Article 196.**

144. Oct. 16, 1876, to Oct. 16, 1881, = 5 y.  
 Oct. 16, 1881, to July 16, 1882, = 9 mo.  
 July 16, 1882, to Aug. 9, 1882, = 24 d.  
 Oct. 16, 1876, to Aug. 9, 1882, = 5 y. 9 mo. 24 d., Ans.
145. Nov. 15, 1879, to Nov. 15, 1880, = 1 y.  
 Nov. 15, 1880, to June 15, 1881, = 7 mo.  
 June 15, 1881, to July 5, 1881, = 20 d.  
 Nov. 15, 1879, to July 5, 1881, = 1 y. 7 mo. 20 d., Ans.
146. Oct. 19, 1781, to Oct. 19, 1814, = 33 y.  
 Oct. 19, 1814, to Dec. 19, 1814, = 2 mo.  
 Dec. 19, 1814, to Jan. 8, 1815, = 20 d.  
 Oct. 19, 1781, to Jan. 8, 1815, = 33 y. 2 mo. 20 d., Ans.
147. July 4, 1776, to July 4, 1862, = 86 y.  
 July 4, 1862, to Dec. 4, 1862, = 5 mo.  
 Dec. 4, 1862, to Jan. 1, 1863, = 28 d.  
 July 4, 1776, to Jan. 1, 1863, = 86 y. 5 mo. 28 d., Ans.

**149.** April = 21 days.

May = 31

June = 8

Ans.  $\overline{60}$  days.**152.** 141 wk. 4 d. 22 h. 16 min.**153.** 37 mi. 170 rd. 1 yd.**154.** 10 T. 8 cwt. 53 lb.**155.** 355 A. 49 sq. rd.  $21\frac{3}{4}$  sq. yd.**156.**  $263^{\circ} 51' 40''$ .**158.** 17 wk. 3 d. 10 h. 17 min.**159.** 3 mi. 124 rd. 1 yd.  $1\frac{1}{2}$  ft.**160.** 3 oz. 17 pwt. 14 gr.**161.**  $13^{\circ} 10' 35''$ .**162.** 61 gal. 1 qt. 1 pt.**150.** May = 5 d. 2 h.

June = 30

July = 31

Aug. = 31

Sept. = 30

Oct. = 31

Nov. = 30

Dec. = 31

Jan. = 31

Feb. = 28

Mar. = 4 9

Ans.  $\overline{282}$  d. 11 h.

## MISCELLANEOUS EXERCISES.

**163.** 18 rd. 5 yd. 2 ft. 11 in.

$$\begin{array}{r} 5\frac{1}{2} \\ \hline 104 \text{ yd.} \end{array}$$

$$\begin{array}{r} 3 \\ \hline 314 \text{ ft.} \end{array}$$

$$\begin{array}{r} 12 \\ \hline 628 \end{array}$$

$$\begin{array}{r} 314 \\ \hline 11 \end{array}$$

$$\text{Ans. } \overline{3779} \text{ in.}$$

**164.** 5 T. 17 cwt. 25 lb.

$$\begin{array}{r} 20 \\ \hline 117 \text{ cwt.} \end{array}$$

$$\begin{array}{r} 100 \\ \hline 11725 \text{ lb.} \end{array}$$

$$\begin{array}{r} \$0.03 \\ \hline \end{array}$$

$$\begin{array}{r} \$351.75, \text{ Ans.} \end{array}$$

**166.** 1 common year = 365 d.

$$1 \text{ day} = \frac{1}{365} \text{ year.}$$

$$\frac{8}{27} \text{ d.} = \frac{8}{27} \times \frac{1}{365} \text{ y.} = \frac{8}{9855}, \text{ Ans.}$$

**165.** \$0.03 ) \$396.18

$$\begin{array}{r} 100 \overline{) 132 \text{ } 06 \text{ lb.}} \end{array}$$

$$\begin{array}{r} 20 \overline{) 1 \text{ } 32 \text{ cwt. } 6 \text{ lb.}} \end{array}$$

$$\begin{array}{r} 6 \text{ T. } 12 \text{ cwt.} \end{array}$$

$$\text{Ans. } 6 \text{ T. } 12 \text{ cwt. } 6 \text{ lb.}$$

**167.** 50 T. 5 ctl. 75 lb.

$$\begin{array}{r} 47 \quad 17 \quad 35 \end{array}$$

$$\text{Ans. } 98 \text{ T. } 3 \text{ ctl. } 10 \text{ lb.}$$

**168.** 1 mi. = 1760 yd. ; 2 mi. =  $2 \times 1760 = 3520$  yd. ;  
 $3520 \div 55 = 64$ . It gains 5 ft. in 55 yd. ; in 3520 yd., or 64  
 times 55 yd., it will gain 64 times 5 ft., or 320 ft. =

19 rd. 6 ft. 6 in., Ans.

**169.** 2 A. 65 sq. rd.

$8\frac{1}{2}$

Ans. 19 A.  $136\frac{1}{2}$  sq. rd., or 19 A. 136 sq. rd. 68 sq. ft. 9 sq. in.

**170.** June 11, 1879, to June 11, 1880, = 366 d.

June 11, 1881, to June 11, 1881, = 365

June 11, 1881, to Aug. 5, 1881, = 55

June 11, 1879, to Aug. 5, 1881, =  $\overline{786}$  d. Ans.

**171.** 9 ) 21 T. 537 lb.

Ans. 2 T.  $726\frac{1}{3}$  lb.

**172.** 47 ) 13267583

60 )  $\overline{282289}$  min.

24 )  $\overline{4704}$  h. 49 min.

$\overline{196}$  d.

Ans. 196 d. 0 h. 49 min.

**173.** 7 A. 148 sq. rd.

160

$\overline{1120}$

148

$\overline{1268}$  sq. rd.

1 A. = 160 sq. rd.

20 A. =  $20 \times 160$  sq. rd. = 3200 sq. rd.

$\frac{1268}{3200} = \frac{317}{800} = .39625$ , Ans.

**174.** 12 ) 24 cd. 102 cu. ft.

$\overline{2}$  cd.  $8\frac{1}{2}$  cu. ft.

128

$\overline{256}$

$8\frac{1}{2}$

16 )  $\overline{264\frac{1}{2}}$  cu. ft.

Ans.  $16\frac{1}{3}\frac{1}{2}$  cu. ft.

**175.** 2 oz. 10 pwt.

11 lb. 5 oz. 10 pwt.

20

12

$\overline{50}$  pwt.

$\overline{137}$

20

$\overline{2750}$  pwt.

50 ) 2750

Ans. 55 spoons.

$$\begin{array}{r}
 176. \text{ 19 quires @ } 12\text{¢ sell for} \dots\dots\dots \$2.28 \\
 \quad 1 \text{ outside quire sells for} \dots\dots\dots 0.08 \\
 \hline
 20 \text{ quires, or 1 ream, sells for} \dots\dots\dots \$2.36 \\
 \quad \text{Cost of 1 ream} \dots\dots\dots 1.75 \\
 \hline
 \quad \text{Gain on 1 ream} \dots\dots\dots \$0.61
 \end{array}$$

$$\text{Gain on 25 reams} = 25 \times \$0.61 = \$15.25, \text{ Ans.}$$

$$\begin{array}{l}
 177. \text{ Mar. 15, 1767, to Mar. 15, 1845,} = 78 \text{ y.} \\
 \quad \text{Mar. 15, 1845, to May 15, 1845,} = 2 \text{ mo.} \\
 \quad \text{May 15, 1845, to June 8, 1845,} = 24 \text{ d.} \\
 \quad \text{Mar. 15, 1767, to June 8, 1845,} = 78 \text{ y. } 2 \text{ mo. } 24 \text{ d., Ans.}
 \end{array}$$

$$178. \quad \frac{8}{8} - \frac{3}{8} = \frac{5}{8}; \text{ remaining; } \frac{5}{8} \text{ of } 68\frac{1}{2} = \frac{5}{8} \text{ of } \frac{137}{2} = 42\frac{1}{2}$$

\$0.72	\$0.90	
68½	42½	
<u>576</u>	<u>180</u>	
432	360	\$49.32, bought for.
36	73½	38.53½, sold for.
<u>\$49.32</u>	<u>\$38.53½</u>	Ans. \$10.78½, loss.

179. Since five cents is the same fractional part of 1 dollar as a cental is of 1 ton, any article is worth as many five cent pieces a cental as dollars a ton.

$$180. \text{ 17 rd. 16 ft. 11 in.} = 3569 \text{ in.}$$

$$\quad \quad \quad \text{18 rd. 5 in.} = 3569 \text{ in.}$$

$$\text{17 rd. 5 yd. 1 ft. 11 in.} = 3569 \text{ in.}$$

Hence they did not differ.

**181.** The time from  $\frac{1}{4}$  before 6 to  $\frac{3}{4}$  past 7 = 2 hours. Hence A would gain 2 hours in 1 day.

Between March 5, 1882, and March 5, 1900, there are 18 years, 14 of which are common years and 4 leap years.

$$14 \text{ com. years} = 14 \times 365 \text{ d.} = 5110 \text{ d.}$$

$$4 \text{ leap years} = 4 \times 366 \text{ d.} = 1464$$

$$\overline{6574 \text{ d.}}$$

$$6574 \times 2 \text{ h.} = 13148 \text{ h.} = 547 \text{ d. } 20 \text{ h., Ans.}$$

### Article 213.

$$25. \quad 1365^{\text{mm}} = 1.365^{\text{m}}$$

$$497^{\text{cm}} = 4.97$$

$$145.51^{\text{m}} = 145.51$$

$$\text{Ans. } \overline{151.845 \text{ meters.}}$$

$$26. \quad 15.16^{\text{Ha}} = 1516^{\text{a}}$$

$$111.55^{\text{a}} = 111.55$$

$$3615^{\text{ca}} = 36.15$$

$$\text{Ans. } \overline{1663.70 \text{ ares.}}$$

$$27. \quad 45.0^{\text{st}}$$

$$276^{\text{dst}} = 27.6$$

$$\overline{17.4^{\text{st}}}, \text{ Ans.}$$

$$28. \quad 3.40^{\text{Hl}}$$

$$6$$

$$\overline{20.40^{\text{Hl}}} = 2040^{\text{l}}, \text{ Ans.}$$

$$29. \quad 21.080^{\text{T}} = 21080^{\text{K}}$$

$$8 \overline{) 21080^{\text{K}}}$$

$$\underline{2635^{\text{K}}}$$

$$\underline{\$ 0.20}$$

$$\underline{\$ 527.00}, \text{ Ans.}$$

$$30. \quad 8.42^{\text{Ha}}$$

$$87.25^{\text{a}} = 0.8725$$

$$\underline{9.2925^{\text{Ha}}}$$

$$365.50^{\text{Ha}} - 9.2925^{\text{Ha}} =$$

$$356.2075^{\text{Ha}}, \text{ Ans.}$$

$$32. \quad 1 \text{ kilo} = 2.2046 \text{ lb.}$$

$$55 \text{ kilos} = 55 \times 2.2046 \text{ lb.} =$$

$$121.253 \text{ lb., Ans.}$$

$$33. \quad 1^{\text{sq m}} = 1.196 \text{ sq. yd.}$$

$$306^{\text{sq m}} = 306 \times 1.196 \text{ sq. yd.} =$$

$$365.976 \text{ sq. yd., Ans.}$$

$$34. \quad 1^{\text{Ha}} = 2.471 \text{ acres.}$$

$$450^{\text{Ha}} = 450 \times 2.471 \text{ A.} = 1111.95 \text{ A., Ans.}$$

35. 1 kilo = 2.2046 lb.

196 lb.  $\div$  2.2046 lb. = 88.9+ kilos, Ans.

36. 1 bushel = 0.3524 <sup>Hl</sup>

210 bu. =  $210 \times 0.3524^{\text{Hl}} =$

74.004 <sup>Hl</sup>, Ans.

38. 1 <sup>Hl</sup> = 2.837 bu.

1 bu. cost \$ 0.65

2.837 bu. cost  $2.837 \times \$0.65 =$   
\$ 1.845+, Ans.

39. 
$$\begin{array}{r} 8 \overline{) 600.58^{\text{Ha}}} \\ 75.0725^{\text{Ha}} \end{array}$$

1 <sup>Ha</sup> = 2.471 A.

$75.0725 \times 2.471 \text{ A.} = 185.504+ \text{A.}$

$185.504 \times \$25 = \$4637.60+, \text{Ans.}$

40. 1 mile = 1.6093 <sup>Km</sup>

1607 mi. =  $1607 \times 1.6093^{\text{Km}} =$

2586.145+ <sup>Km</sup>, Ans.

41. 287 ft. 6 in.

$$\begin{array}{r} 19 \quad 6 \\ 307 \text{ ft. } 0 \text{ in.} \end{array}$$

1 ft. = 30.48 <sup>cm</sup>

307 ft. =  $307 \times 30.48^{\text{cm}} =$

9357.36 <sup>cm</sup>, or 93.5736 <sup>m</sup>, Ans.

42. 1 ft. = 30.48 <sup>cm</sup>; 3 ft. or 1 yd. = 91.44 <sup>cm</sup> or 0.9144 <sup>m</sup>

65 yd. =  $65 \times 0.9144^{\text{m}} = 59.436^{\text{m}}$

$59.436 \times \$1.20 = \$71.32+$ , cost of carpet.

$65 \times \$1.20 = \$78.00$ , what it sold for.

$\$78 - \$71.32 = \$6.68$ , gain, Ans.

43. A cubic meter has the same capacity as a kiloliter.

$40.64^{\text{cm m}} = 40.64^{\text{kl}}; 1^{\text{Hl}} = 2.837 \text{ bu.}; 1^{\text{kl}} = 28.37 \text{ bu.}$

$40.64^{\text{kl}} = 40.64 \times 28.37 \text{ bu.} = 1152.956+ \text{bu.}$

$1152.956 \times \$0.80 = \$922.36$ , Ans.



**Article 222.**

6. 46 ft. 3 in. = 46.25 ft.

35 ft. 6 in. = 35.5 ft.

$$\begin{array}{r} 46.25 \\ 35.5 \\ \hline \end{array}$$

$$\begin{array}{r} 23125 \\ 23125 \\ \hline \end{array}$$

$$\begin{array}{r} 23125 \\ 13875 \\ \hline \end{array}$$

$$\begin{array}{r} 23125 \\ 13875 \\ \hline 23125 \\ 13875 \\ \hline \end{array}$$

$$\begin{array}{r} 23125 \\ 13875 \\ \hline 13875 \\ 13875 \\ \hline \end{array}$$

2) 1641.875

Ans. 820.9375 sq. ft., or

820 sq. ft. 135 sq. in.

10. 18 ft. = 6 yd.

15 ft. 6 in. =  $5\frac{1}{2}$  yd.

$6 \times 5\frac{1}{2} = 31$  sq. yd.

31 sq. yd.  $\div$  1 yd. = 31 yd., Ans.

12. 45

$$\begin{array}{r} 45 \\ 48 \\ \hline \end{array}$$

$$\begin{array}{r} 360 \\ 180 \\ \hline \end{array}$$

$$\begin{array}{r} 180 \\ 160 \\ \hline \end{array}$$

160) 2160 sq. rd.

Ans.  $13\frac{1}{2}$  A.

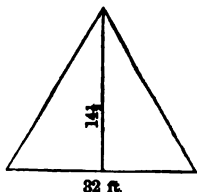
13.

1 meter = 39.37 in.

39.37 in.  $\div$  12 in. = 3.28 ft.

15 meters =  $15 \times 3.28$  ft. = 49.2 ft.

$49.2 \times 3.1416 = 154.56+$  ft., Ans.



7. 314.16

$$\begin{array}{r} 314.16 \\ 50 \\ \hline \end{array}$$

2) 15708.00

Ans. 7854 sq. ft.

8. 3.1416

$$\begin{array}{r} 3.1416 \\ 400 \\ \hline \end{array}$$

Ans. 1256.6400 ft.

9. 3.1416) 1256.6400

Ans. 400 ft.

11. 18.75

$$\begin{array}{r} 18.75 \\ 9375 \\ \hline \end{array}$$

$$\begin{array}{r} 9375 \\ 13125 \\ \hline \end{array}$$

$$\begin{array}{r} 13125 \\ 15000 \\ \hline \end{array}$$

$$\begin{array}{r} 15000 \\ 1875 \\ \hline \end{array}$$

9) 351.5625 sq. ft.

50) 39.0625 sq. yd.

Ans. .78125 yd., or  $28\frac{1}{2}$  in.

14.

$$(32 \times 14\frac{1}{2}) \div 2 = \frac{8}{2} \times \frac{29}{2} \times \frac{1}{2} =$$

232 sq. ft., Ans.

15. 564.50

260

3387000

112900

146770.00 <sup>sq m</sup>

146770.00 <sup>sq m</sup> ÷ 10000 =

14 <sup>Ha</sup> 6770 <sup>sq m</sup>, Ans.

16. 288

12.5

1440

576

288

9 ) 3600.0 sq. ft.

400. sq. yd.

.60

\$ 240.00, Ans.

17. 60 ft. = radius of circle.

60 × 2 = 120 ft., diameter.

120 × 3.1416 = 376.992, circumference.

376.992

60

2 ) 22619.520

11309.76 sq. ft. = 41 sq. rd. 147+ sq. ft., Ans.

18. 2.5 ft. × 2.5 ft. = 6.25 sq. ft. in bottom.

2.5 × 6 = 15 sq. ft. in 1 side.

15 × 4 = 60 sq. ft. in 4 sides.

60 sq. ft. + 6.25 sq. ft. = 66.25 sq. ft., Ans.

19. 751

348

6008

3004

2253

272  $\frac{1}{4}$  ) 261348 sq. ft.

4 ) 4

1089 ) 1045392

160 ) 959 sq. rd. 260  $\frac{1}{4}$  sq. ft.

5 A. 159 sq. rd.

Ans. 5 A. 159 sq. rd. 260  $\frac{1}{4}$  sq. ft. 144 ) 167062  $\frac{1}{2}$  sq. in.

20. 2 ft. 6 in. = 30 in.

30

9

270 sq. in. in 1 stone.

75

1350

1890

20250 sq. in. in 75 stones.

8  $\frac{1}{2}$

162000

5062  $\frac{1}{2}$

1160  $\frac{5}{8}$  sq. ft.

\$ 0.20

9 ) 1160  $\frac{5}{8}$  sq. ft.

128  $\frac{3}{8}$  sq. yd.

\$ 232.03  $\frac{1}{8}$ , cost, Ans.

**Article 226.**

25.  $2\frac{1}{2}$  ft. =  $\frac{4}{2}$  ft., 18 in. =  $\frac{3}{2}$  ft.;  $\frac{5}{2} \times \frac{3}{2} \times 4 = 15$  cu. ft., Ans.

26. 10 ft. 6 in. =  $2\frac{1}{2}$  ft.;  $\frac{21}{2} \times \frac{21}{2} \times \frac{21}{2} = \frac{9261}{8} =$   
1157 $\frac{5}{8}$  cu. ft., Ans.

27.  $13\frac{3}{4} \times 6 = 80\frac{1}{4}$  sq. ft.;  $294\frac{1}{4} \div 80\frac{1}{4} = \frac{1177}{4} \times \frac{4}{321} =$   
 $3\frac{3}{4}$  ft., Ans.

28. 15 decimeters =  $1\frac{1}{2}$  meters;  $\frac{3}{2} \times 1 \times 2 = 3$  cu. meters, Ans.

29. 
$$\begin{array}{r} 42 \\ 60 \\ \hline 2520 \\ 8\frac{1}{2} \\ \hline 20160 \\ 1260 \end{array}$$

27 )  $\overline{21420}$  cu. ft.

Ans.  $793\frac{1}{2}$  cu. yd.

30. 
$$\begin{array}{r} 1.45 \\ 3 \\ \hline 4.35 \\ 2 \\ \hline \text{Ans. } 8.700 \text{ cu. meters.} \end{array}$$

31. 32 ft. =  $10\frac{2}{3}$  yd.; 3 ft. = 1 yd.

1 yd.  $\times 3.1416 = 3.1416$  yd., circumference.

$\frac{1}{2}$  yd. = radius;  $3.1416 \times \frac{1}{2} \div 2 = .7854$  sq. yd., area  
of base;  $.7854 \times 10\frac{2}{3} = 8.3776$  cu. yd., Ans.

32. 4 ft. 6 in. =  $4\frac{1}{2}$  ft.; 6 ft. 4 in. =  $6\frac{2}{3}$  ft.

$4\frac{1}{2} = \frac{9}{2}$ ,  $6\frac{2}{3} = \frac{19}{3}$ ;  $\frac{9}{2} \times \frac{19}{3} \times \frac{6}{3} = 1026$  sq. ft., Ans.

**Article 227.**

$$33. 32 \times 8 \times 4 = 1024 \text{ cu. ft. ; } 1024 \div 128 = 8 \text{ cd., Ans}$$

$$34. 4 \times 4 \times 64 = 1024 \text{ cu. ft. ; } 1024 \div 128 = 8 \text{ cd., Ans.}$$

$$35. 28 \times 4 \times 6\frac{1}{2} = 728 \text{ cu. ft. ; } 728 \div 128 = 5\frac{1}{2} \text{ cd., Ans.}$$

$$36. 4 \times 56 = 224 ; 10 \text{ cd.} \times 128 = 1280 \text{ cu. ft.}$$

$$1280 \div 224 = 5\frac{5}{7} \text{ ft., Ans.}$$

$$37. 3 \text{ ft. 6 in.} = 3\frac{1}{2} \text{ ft., } 4 \text{ ft. 6 in.} = 4\frac{1}{2} \text{ ft.}$$

$$\frac{7}{2} \times \frac{9}{2} \times 4 \times 2 = 126 \text{ cu. ft. ; } 126 \div 128 = 9\frac{3}{4} \text{ cd., Ans.}$$

$$38. 30 \times 16 \times 12 = 5760 \text{ cu. ft. ; } 5760 \div 128 = 45 \text{ cd.}$$

$$\$5.25 \times 45 = \$236.25, \text{ Ans.}$$

**Article 230.**

$$40. 1 \text{ ft. 6 in.} = \frac{3}{2} \text{ ft. ; } 16 \times \frac{3}{2} = 24 \text{ bd. ft., Ans.}$$

$$41. 16 \text{ in.} = \frac{4}{3} \text{ ft. ; } 20 \times \frac{4}{3} \times \frac{5}{2} = 66\frac{2}{3} \text{ bd. ft., Ans.}$$

$$42. 18 + 16 = 34 ; \frac{34}{2} = 17 \text{ in.} = \frac{17}{12} \text{ ft. ; } 20 \times 10 \times \frac{17}{12} =$$

$$283\frac{1}{3} \text{ bd. ft., Ans}$$

$$43. 9 \text{ in.} = \frac{3}{4} \text{ ft. ; } 44 \times 18 \times 3 \times \frac{3}{4} = 1782 \text{ bd. ft.}$$

$$\frac{1782 \times \$23}{1000} = \$40.986., \text{ Ans.}$$

$$44. 21 \text{ in.} = \frac{7}{4} \text{ ft.}; 18 \times \cancel{24}^6 \times 2 \times \frac{7}{\cancel{4}} = 1512 \text{ bd. ft.}$$

$$\frac{1512 \times \$35}{1000} = \$52.92, \text{ Ans.}$$

## MISCELLANEOUS EXERCISES.

$$45. 9432 \div 131 = 72 \text{ ft., Ans.}$$

$$46. \cancel{8}^4 \times 3 \times \frac{11}{\cancel{2}} = 132 \text{ cu. ft.}; 132 \div 128 = 1\frac{1}{32} \text{ cd.}$$

$$\$5.50 \times 1\frac{1}{32} = \$5.67+, \text{ Ans.}$$

$$47. 30 \text{ ft. 6 in.} = \frac{61}{2} \text{ ft.}; 20 \times \frac{61}{\cancel{2}} \times \cancel{2} = 1220 \text{ bd. ft., Ans.}$$

$$48. 28 + 20 = 48 \text{ in.}; \frac{1}{2} \text{ of } 48 \text{ in.} = 24 \text{ in., or 2 ft.}$$

$$6 \times 16 \times 2 = 192 \text{ bd. ft.}; \frac{192 \times \$40}{1000} = \$7.68, \text{ Ans.}$$

$$49. 90^{\text{cm}} = 0.9^{\text{m}}; 110^{\text{cm}} = 1.1^{\text{m}}; 2.50 \times 0.9 \times 1.1 = 2.475^{\text{cu m}};$$

$$2.475^{\text{cu m}} = 2.475^{\text{kl}} = 24.75^{\text{m}}, \text{ Ans.}$$

$$50. 18 \times 9 \times 2 = 324 \text{ sq. ft. in sides.}$$

$$12 \times 9 \times 2 = 216 \text{ sq. ft. in ends.}$$

$$540 \text{ sq. ft. in walls.}$$

$$1 \text{ ft. 8 in.} = \frac{5}{3} \text{ ft.}; 12 \text{ yd.} = 36 \text{ ft.}$$

$$\cancel{36}^{12} \times \frac{5}{\cancel{3}} = 60 \text{ sq. ft. in 1 roll of paper.}$$

$$540 \div 60 = 9 \text{ rolls, Ans.}$$

**51.**

$$4 \times 3 \times 4 = 48$$

$$\text{Ans. } \frac{.8}{38.4} \text{ bu.}$$

**52.**

$$2 \text{ ft. } 6 \text{ in.} = \frac{5}{4} \text{ ft.}; 1 \text{ ft. } 9 \text{ in.} = \frac{7}{4} \text{ ft.}$$

$$\frac{5}{4} \times \frac{7}{4} \times 2 = 8\frac{3}{4} \text{ cu. ft.}$$

$$8\frac{3}{4} \times 7\frac{1}{2} = \frac{35}{4} \times \frac{15}{2} = \frac{525}{8} = 65\frac{5}{8} \text{ gal., Ans.}$$

$$53. 12 \text{ ft. } 6 \text{ in.} = 12\frac{1}{2} \text{ ft.}; 40 \times 12\frac{1}{2} = 500 \text{ sq. ft.}$$

$$8\frac{1}{2} \text{ in.} \times 2 = 17; 500 \times 17 = 8500 \text{ bricks, Ans.}$$

$$54. 8 \times 5 \times 4 = 160 \text{ cu. ft.}; 1 \text{ ton of Lehigh fills } 40 \text{ cu. ft.}$$

$$160 \div 40 = 4 \text{ tons of Lehigh}; 1 \text{ ton of Lackawanna fills } 45 \text{ cu. ft.}; 160 \div 45 = 3\frac{4}{9} \text{ tons of Lackawanna.}$$

$$55. 4840 \text{ sq. in.} = \frac{4840}{144} \text{ sq. ft.}; 3\frac{1}{3} \text{ ft.} = \frac{10}{3} \text{ ft.}$$

$$\frac{605}{144} \times \frac{5}{3} = \frac{3025}{27} = 112\frac{1}{27} \text{ cu. ft.}$$

$$\frac{18}{9} \times 112\frac{1}{27} \times 1000 = 112037\frac{1}{27} \text{ oz.}$$

$$112037\frac{1}{27} \div 16 = 7002\frac{1}{4} \text{ lb., Ans.}$$

$$56. 18 \text{ in.} = 1\frac{1}{2} \text{ ft.}; 33 + 30 = 63; 63 \times 2 = 126 \text{ ft.}$$

$$126 \times 9 = 1134 \text{ sq. ft. in walls.}$$

$$1134 \times 1\frac{1}{2} = 1701 \text{ cu. ft. in walls.}$$

$$\frac{3}{2} \times \frac{3}{2} \times 4 = 9; 9 \times 9 = 81 \text{ cu. ft. in corners.}$$

$$1701 + 81 = 1782 \text{ cu. ft., Ans.}$$

**Article 231.****50.**

$$1116 = 2 \times 2 \times 3 \times 3 \times 31$$

$$1364 = 2 \times 2 \times 11 \times 31$$

$$2 \times 2 \times 31 = 124, \text{ greatest com. divisor.}$$

$$2 \times 2 \times 3 \times 3 \times 11 \times 31 = 12276, \text{ least c. m.}$$

$$12276 \div 124 = 99, \text{ Ans.}$$

$$51. \quad .008$$

$$.06$$

$$16 \overline{) 00.048}$$

$$\text{Ans. } .003$$

$$52. \quad 160 \overline{) 3.00000} \\ \underline{.01875}, \text{ Ans.}$$

$$53. \quad 7 \overline{) 3.00} \\ \underline{.42\frac{2}{3}}, \text{ Ans.}$$

$$54. \quad 1 \text{ mi.} = 5280 \text{ ft.} \\ 10 \text{ mi.} = 10 \times 5280 \text{ ft.} = 52800 \text{ ft.}$$

$$52800 \\ 4 \\ 33 \overline{) 211200} \text{ ft.} \\ \text{Ans. } 6400 \text{ rails.}$$

$$55. \quad 3\frac{1}{8} = \frac{25}{8}; \quad 28 \div \frac{56}{15} = \frac{28}{1} \times \frac{15}{56} = \$7\frac{1}{2}, \text{ cost of 1 ton.}$$

$$17.65 \times \$7\frac{1}{2} = \$132.375, \text{ Ans.}$$

$$56. \quad \frac{2}{5} = \text{land}; \quad \frac{3}{5} = \text{house}; \quad \frac{5}{5} + \frac{2}{5} = \frac{7}{5} = \$14000.$$

$$\frac{5}{5} = \$14000 \div \frac{7}{5} = \$10000; \quad \frac{2}{5} \text{ of } \$10000 = \$4000, \text{ Ans.}$$

$$57. \quad 1 \text{ sq. m.} = 640 \text{ A.}; \quad \frac{2}{5} \text{ of } \cancel{640}^{128} = 256; \quad \frac{1}{4} \text{ of } \cancel{640}^{160} = 160.$$

$$256 + 160 + 100 = 516 \text{ A.}; \quad 640 - 516 = 124 \text{ A., Ans.}$$

$$58. \quad \$570 + \$80 = \$650.$$

$$\frac{2}{5} = \$650.$$

$$\frac{5}{5} = \frac{325}{2} \times 5 = \$1625 \text{ in bank.}$$

$$\$570 + \$1625 = \$2195, \text{ Ans.}$$

$$59. \quad 10 \text{ mi.} = 52800 \text{ ft.}$$

$$320 \text{ ft.}$$

$$300$$

$$620$$

$$2$$

$$1240 \text{ ft.} ) 52800 \text{ ft.}$$

$$\text{Ans. } 42\frac{2}{3}.$$

60.

$$144 \overline{) 20000} \text{ sq. in.}$$

$$9 \overline{) 138} \text{ sq. ft. } 128 \text{ sq. in.}$$

$$15 \text{ sq. yd. } 3 \text{ sq. ft.}$$

$$\text{Ans. } 15 \text{ sq. yd. } 3 \text{ sq. ft. } 128 \text{ sq. in.}$$

61.

$$28 \times 15 = 420 \text{ sq. ft.}$$

$$420 \text{ sq. ft.} = 46\frac{2}{3} \text{ sq. yd.}$$

$$46\frac{2}{3} \div \frac{3}{4} = \frac{140}{3} \times \frac{4}{3} = \frac{560}{9} =$$

$$62\frac{2}{3} \text{ yd., Ans.}$$

62.  $1 \text{ A.} = 43560 \text{ sq. ft. ; } 43560 \text{ ft.} \times 1 = 43560 \text{ cu. ft.}$   
 $43560 \text{ cu. ft.} = 1613\frac{1}{3} \text{ cu. yd., Ans.}$

63.  $8 \text{ in.} \times 4 \text{ in.} = 32 \text{ sq. in.} = \frac{2}{3} \text{ sq. ft.}$   
 $\frac{1}{4} \text{ mi., or } 1320 \text{ ft.} \times 8 \text{ ft.} = 10560 \text{ sq. ft.}$   
 $10560 \div \frac{2}{9} = 47520 \text{ bricks, Ans.}$

64.  $8 \times 2 = 16 \text{ sq. in.} = \frac{1}{9} \text{ sq. ft. ; } \frac{1}{4} \text{ mi.} = 1320 \text{ ft.}$   
 $1320 \times 8 = 10560 \text{ sq. ft. ; } 10560 \div \frac{1}{9} = 95040 \text{ bricks, Ans.}$

65.  $20 \times 20 = 400 \text{ sq. rd. in square.}$   
 $3.1416$   
 $\quad 20$   
 $\hline 62.8320, \text{ circumference of circle.}$   
 $10, \text{ radius.}$   
 $2 \overline{) 628.3200}$   
 $\hline 314.16 \text{ sq. rd. in circle.}$   
 $400 \text{ sq. rd.} - 314.16 = 85.84 \text{ sq. rd., Ans.}$

66.  $\frac{1}{4} \text{ A.} = 10890 \text{ sq. ft.}$   
 $10890 \times 1 = 10890 \text{ cu. ft.}$   
 $10890 \times 930 = 10127700 \text{ oz.}$   
 $16 \overline{) 10127700 \text{ oz.}}$   
 $2000 \overline{) 632981\frac{1}{2} \text{ lb.}}$   
 $\text{Ans. } 316\frac{1}{3}\frac{5}{6} \text{ T.}$

67.  $30 \text{ in.} = \frac{5}{6} \text{ yd. ; } \frac{5}{6} \times 45 = \frac{225}{6} = 37\frac{1}{2} \text{ sq. yd., Ans.}$

68.  $1 \text{ hektoliter} = 26.417 \text{ gal. ; } \$ 5.00 \times 26.417 = \$ 132.08\frac{1}{2}$   
 $\$ 132.08\frac{1}{2} - \$ 100 = \$ 32.08\frac{1}{2} \text{ gain, Ans.}$

## 69.

$200 \div 50 = 4 \text{ lots ; } 5 \times 150 = 750 \text{ ft. ; } 2 \times 200 = 400 \text{ ft.}$   
 $400 + 750 = 1150 \text{ ft. of fence ; } \$ 0.16\frac{1}{2} \text{ per rod} = 1 \text{ ¢ per ft.}$   
 $1150 \times 1 \text{ ¢} = \$ 11.50, \text{ Ans.}$



70.  $5 \text{ ft.} \times 3.1416 = 15.708 \text{ ft.}$ , circumference.  
 $1 \text{ mi.} = 5280 \text{ ft.}$ ;  $26 \text{ mi.} = 26 \times 5280 \text{ ft.} = 137280 \text{ ft.}$   
 $137280 \text{ ft.} \div 15.708 \text{ ft.} = 8739\frac{19}{100}$  times, Ans.
71.  $12 \times 40 \times 8\frac{1}{2} = 4200 \text{ cu. ft.}$ ;  $4200 \div 128 = 32\frac{1}{8}$  cd., Ans.
72.  $1 \text{ rd. } 8 \text{ ft.} = \frac{49}{2} \text{ ft.}$ ;  $\frac{3}{4} \text{ rd.} = \frac{99}{8} \text{ ft.}$   
 $\frac{49}{2} \times \frac{99}{8} = \frac{4851}{16} = 303\frac{3}{16} \text{ sq. ft.}$ , Ans.
73.  $32 \text{ ft. } 8 \text{ in.} = 32\frac{2}{3} \text{ ft.}$ ;  $32\frac{2}{3} \times 55 = 1796\frac{2}{3} \text{ sq. ft.}$   
 $1796\frac{2}{3} \div 8 = 224\frac{1}{2} \text{ sq. ft.} = 74\frac{1}{4} \text{ yd.}$ , Ans.
74.  $1 \text{ mi.} = 5280 \text{ ft.}$ ;  $\frac{3}{4} \text{ mi.} = 3960 \text{ ft.}$   
 $3960 \times 60 = 237600 \text{ sq. ft.}$ ;  $1 \text{ A.} = 43560 \text{ sq. ft.}$   
 $237600 \div 43560 = 5\frac{1}{11} \text{ A.}$ , Ans.
75.  $(20 + 20) \times 2 = 80 \text{ ft.}$ ;  $80 \times 12 = 960 \text{ sq. ft.}$  in walls.  
 $20 \times 20 = 400 \text{ sq. ft.}$  in ceiling;  $960 + 400 = 1360 \text{ sq. ft.}$   
 $\frac{1}{3}$  of  $1360 = 272 \text{ sq. ft.}$ ;  $1360 - 272 = 1088 \text{ sq. ft.}$   
 $1088 \text{ sq. ft.} = 120\frac{2}{3} \text{ sq. yd.}$   
 $120\frac{2}{3} \times \$0.16\frac{2}{3} = \$20.14\frac{2}{3}$ , Ans.
76.  $20 \times 20 = 400 \text{ bd. ft.}$ ;  $\frac{1}{11} = 400 \text{ bd. ft.}$   
 $\frac{1}{11} = \frac{400}{10} \times 11 = 440 \text{ bd. ft.}$   $\frac{440 \times \$35}{1000} = \$15.40$ , Ans.
77.  $17.28 \div .083\frac{1}{3} = 207.36$   
 $\frac{7\frac{1}{2}}{3000} = \frac{15}{2} \times \frac{1}{\cancel{3000}_{200}} = \frac{1}{400} = 0.0025$   
 $207.36 \times 0.0025 = 0.5184$ , Ans.
78.  $1 \text{ day} = 24 \text{ h.}$ ;  $3 \text{ P. M.} = 15 \text{ h.}$  from midnight.  
 $\frac{15}{24} = \frac{5}{8} = 0.625$ , Ans.

79.  $(16 + 14) \times 2 = 60$  ft., perimeter.

$60 \times 8 = 480$  sq. ft. in walls.

$2 \times 3 = 6$  sq. ft. in l.yd. of paper;  $480 \div 6 =$

80 yards, Ans.

80. 3.15 P.M., Aug. 3, is 33 d. 15 h. 15 min. from the beginning of July 1st.

33 d. 15 h. 15 min.

$\begin{array}{r} 7 \quad 15 \quad 30 \\ \hline \end{array}$

25 d. 23 h. 45 min.

25 d. 23 h. 45 min. from July 1 is July 26, 11.45 P.M., Ans.

81. 3 in. =  $\frac{1}{4}$  ft.;  $\cancel{300}^{75} \times \frac{1}{4} = 75$  sq. ft.; 75 sq. ft. =

$8\frac{1}{2}$  sq. yd., Ans.

82. 1 pt.  $\div 2 = \frac{1}{2}$  qt.;  $3\frac{1}{2}$  qt. =  $\frac{7}{2} \div 4 = \frac{7}{8}$  gal.

$18\frac{1}{2} \times \$0.45 = \$8.49\frac{1}{2}$ , Ans.

83.

$0.7\frac{1}{2} = \frac{59}{8} \times \frac{1}{10} = \frac{59}{80}$ ;  $\frac{7}{10} + \frac{3}{8} = \frac{86}{80}$ ;  $\frac{86}{80} - \frac{59}{80} = \frac{27}{80}$ , Ans.

84. 1 A. = 160 sq. rd.; 8 rd. sq. = 64 sq. rd.

$64 + 8 = 72$  sq. rd.;  $160 - 72 = 88$  sq. rd., Ans.

85.  $4\frac{1}{2} \times 128$  cu. ft. = 576 cu. ft.; 5 ft. 6 in. =  $\frac{11}{2}$  ft.

$\frac{9}{2} \times \frac{11}{2} = \frac{99}{4}$  sq. ft.;  $576 \div \frac{99}{4} = \cancel{576}^{64} \times \frac{4}{99} = 23\frac{2}{11}$  ft., Ans.

86.  $\cancel{80}^{20} \times \frac{3}{4} = 60$  sq. yd.;  $60 \times 9 = 540$  sq. ft.

$540 \div 30 = 18$  ft., Ans.

87. 1 A. = 43560 sq. ft. ; 5 A. = 217800 sq. ft.  
 $217800 \div 600 = 363$  ft. wide ;  $(600 + 363)$ , or 963,  $\times 2 =$   
 1926 ft., Ans.

88. 18 in. =  $\frac{3}{4}$  ft. ; 40 in. =  $1\frac{2}{3}$  ft. ;  $2 \times \frac{3}{4} \times 56 = 168$  sq. ft.  
 $168 \div \frac{10}{3} = 50\frac{2}{3}$  ft. =  $16\frac{2}{3}$  yd., Ans.

89. 1 cu. yd. = 1728 cu. in.  $\times 27 = 46656$  cu. in.  
 1 2-inch cube = 8 cu. in. ;  $46656 \div 8 = 5832$ , Ans.

90. 20 in. =  $1\frac{2}{3}$  ft. ;  $15 \times 1\frac{2}{3} \times 20 = 500$  bd. ft.  
 .05 of 500 = 25 ft. ;  $500$  ft. - 25 ft. = 475 ft., Ans.

91. 90 rd. sq. = 8100 sq. rd. ;  $8100 - 90 = 8010$  sq. rd.  
 $8010 \div 160 = 50\frac{1}{16}$  A. ;  $\$240 \times 50\frac{1}{16} = \$12015$ , Ans.

92.  $9\frac{1}{4} - 3\frac{3}{8} = 5\frac{1}{8}$  ;  $\frac{5\frac{1}{8}}{9\frac{1}{4}} = \frac{194}{35} \times \frac{7}{64} = \frac{97}{160}$ , Ans.

93. 12 rd. = 198 ft. ; 10 rd. = 165 ft.  
 $(198 + 165)$ , or 363,  $\times 2 = 726$  ft. ;  $726 \times 6 = 4356$  sq. ft.  
 $6 \times 6$ , or 36,  $\times 4 = 144$  sq. ft. in corners.  
 $4356 - 144 = 4212$  sq. ft. = 468 sq. yd.  
 $\$0.75 \times 468 = \$351$ , Ans.

94.  $(240 + 160) \times 2 = 800$  ft.  
 $800 \times 6 = 4800$  sq. ft. on 1 side.  
 $4800 \times 2 = 9600$  sq. ft. on 2 sides.  
 $9600$  sq. ft.  $\div 9 = 1066\frac{2}{3}$  sq. yd.  
 $1066\frac{2}{3} \times \$0.05 = \$53.33\frac{1}{3}$ , Ans.

95. Feb. = 24 d. 1 h. 30 min.

Mar. = 31

Apr. = 30

May = 10 3 h. 40 min.

Ans. 95 d. 5 h. 10 min.

96.

$$9 \times \frac{5}{4} \times \frac{225}{900} = 10125 \text{ sq. yd.}; 10125 \div \frac{3}{4} = \frac{3375}{10125} \times \frac{4}{3} = 13500 \text{ yd., Ans.}$$

97.  $30 \times 27 = 810 \text{ sq. ft.}; 810 \div 9 = 90 \text{ sq. yd.}$

$90 \div 1 = 90 \text{ yd.}; 90 \times \$1.25 = \$112.50$

$90 \div \frac{3}{4} = 120 \text{ yd.}; 120 \times \$1 = \$120$

$\$120 - \$112.50 = \$7.50.$  Ans. Yard wide; \$7.50.

98.  $2 \times 1 \times 1.4 = 2.8^{\text{cu m}}; 2.8^{\text{cu m}} = 2.8^{\text{kl}} = 28^{\text{hl}}$

$28 \times 75^{\text{k}} = 2100^{\text{k}} = 2.1^{\text{T}}, \text{ Ans.}$

99.

$112 \times 25 \times 2 = 5600 \text{ sq. ft.}; 5600 \times 10 = 56000 \text{ shingles.}$

$56.000 \times \$6.50 = \$364, \text{ Ans.}$

100.  $\$0.18\frac{1}{2} \times 12 = \$2.25, \text{ Ans.}$

101.  $14\frac{1}{8} \times 5\frac{1}{8} = \frac{119}{8} \times \frac{45}{8} = \$83\frac{1}{8}$

$12\frac{3}{4} \times 6\frac{1}{2} = \frac{51}{4} \times \frac{13}{2} = \$82\frac{1}{2}$

$14\frac{1}{8} + 12\frac{3}{4} = 27\frac{5}{8}; 27\frac{5}{8} \times \$0.25 = \$6\frac{3}{8}$

$\$83\frac{1}{8} + \$82\frac{1}{2} + \$6\frac{3}{8} = \$173\frac{3}{4} = \$173.45\frac{1}{2}, \text{ Ans.}$

$$102. 3\frac{1}{3} \times 4\frac{1}{3} = \frac{10}{3} \times \frac{37}{9} = \frac{370}{27}$$

$$\frac{37}{9} - \frac{10}{3} = \frac{37}{9} - \frac{30}{9} = \frac{7}{9}; \quad \frac{1}{2} \text{ of } \frac{7}{9} = \frac{7}{18}$$

$$\frac{370}{27} - \frac{7}{18} = \frac{740}{54} - \frac{21}{54} = \frac{719}{54} = 13\frac{1}{4}, \text{ Ans.}$$

$$103. 19\frac{3}{8} \div 17\frac{1}{2} = \$\frac{31}{28}; \quad \frac{4}{5} \text{ of } \frac{31}{28} = \$\frac{31}{35} = \$0.88\frac{1}{2}, \text{ Ans.}$$

$$104. 1 \text{ yd. sells for } \$\frac{2}{3}; \quad \frac{2}{3} \text{ yd. sells for } \frac{2}{3} \times \$\frac{2}{3} = \$\frac{4}{9}.$$

$$\$ \frac{4}{9} - \$ \frac{1}{3} = \$ \frac{1}{9}, \text{ cost of } \frac{2}{3} \text{ yd. } \quad \$ \frac{1}{9} \times \frac{9}{2} = \$ \frac{1}{2}, \text{ cost of 1 yd.}$$

$$\frac{2}{3} \text{ of } \$ \frac{1}{2} = \$ \frac{1}{3} = \$0.52\frac{1}{2}, \text{ cost of } \frac{2}{3} \text{ yd., Ans.}$$

**Article 241.**

$$35. \$2575 \times .40 = \$1030; \quad \$2575 + \$1030 = \$3605, \text{ Ans.}$$

$$36. \$1890 \times .83\frac{1}{3} = \$1575; \quad \$1890 - \$1575 = \$315, \text{ Ans.}$$

**Article 242.****37.**

$$8500 \times .28 = 2380 \text{ T., Ans.}$$

**38.**

$$6840 \times .03 = 205.20 \text{ gal., Ans.}$$

**39.**

$$2584 \times .00\frac{1}{4} = 22.61 \text{ mi., Ans.}$$

**40.**

$$3460 \times .35 = 1211 \text{ men, Ans.}$$

**41.**

$$\$5000 \times .09\frac{3}{4} = \$487.50, \text{ Ans.}$$

**42.**

$$\$645.50 \times .08 = \$51.64, \text{ Ans.}$$

**43.**

$$\$13.56 \times .06 = \$0.8136, \text{ Ans.}$$

**44.**

$$\$817.68 \times .62\frac{1}{2} = \$511.05, \text{ Ans.}$$

45.  $100\% - 15\% = 85\%$ ;  $\$4850 \times .85 = \$4122.50$ , Ans.

46.  $100\% + 16\% = 116\%$ ;  $\$9675.75 \times 1.16 = \$11223.87$ , Ans.

47.

$\$186.80 \times .05 = \$9.34$ , Ans.

48.

$61450 \times .24 = 14748$ , Ans.

49.

$\$4500 \times 2.85 = \$12825$ , Ans.

50.

$100\% - 33\frac{1}{3}\% = 66\frac{2}{3}\%$

$\$8550 \times .66\frac{2}{3} = \$5700$ , Ans.

51.  $100\% + 15\% = 115\%$ ;  $\$345.75 \times 1.15 = \$397.6125$

$100\% - 15\% = 85\%$ ;  $\$397.6125 \times .85 = \$337.97$ , Ans.

64.  $\frac{57}{600} = \frac{19}{200} = .09\frac{1}{2}$ , or  $9\frac{1}{2}\%$ , Ans.

### Article 243.

65.  $\frac{18275}{215000} = \frac{731}{8600} = .08\frac{1}{2}$ , or  $8\frac{1}{2}\%$ , Ans.

66.  $\frac{8}{130} = \frac{4}{65} = .06\frac{2}{13}$ , or  $6\frac{2}{13}\%$ , Ans.

67.  $\frac{160}{625} = \frac{32}{125} = .25\frac{3}{5}$ , or  $25\frac{3}{5}\%$ , Ans.

68.  $\frac{490}{5000} = \frac{49}{500} = .09\frac{4}{5}$ , or  $9\frac{4}{5}\%$ , Ans.

69.  $\frac{600}{720} = \frac{5}{6} = .83\frac{1}{3}$ , or  $83\frac{1}{3}\%$ , Ans.

70.  $\frac{70}{500} = \frac{7}{50} = .14$ , or  $14\%$ , Ans.

$$71. \frac{85}{1700} = \frac{1}{20} = .05, \text{ or } 5\%, \text{ Ans.}$$

$$72. \frac{57375}{765000} = \frac{51}{680} = .07\frac{1}{2}, \text{ or } 7\frac{1}{2}\%, \text{ Ans.}$$

$$73. \frac{246}{1640} = \frac{123}{820} = .15, \text{ or } 15\%, \text{ Ans.}$$

$$74. \frac{16825}{134600} = \frac{673}{5384} = .12\frac{1}{2}, \text{ or } 12\frac{1}{2}\%, \text{ Ans.}$$

$$82. \frac{\$16.22}{\$} \times \frac{20}{100} = \$324.40, \text{ Ans.}$$

$$83. 100\% - 40\% = 60\%; \frac{59}{\cancel{177}} \times \frac{5}{100} = 295 \text{ sheep, Ans.}$$

### Article 244.

$$\begin{array}{cc} \text{84.} & \text{85.} \\ \frac{\$125}{\frac{8}{2}} \times \frac{25}{100} = \$1562.50, \text{ Ans.} & \frac{.108}{.75} \times 100 = 14.4 \text{ tons, Ans} \end{array}$$

$$\begin{array}{cc} \text{86.} & \text{87.} \\ \frac{\frac{16}{24}}{3} \times 100 = 66\frac{2}{3} \text{ bu., Ans.} & \frac{7.80}{.75} \times 100 = 1040 \text{ yd., Ans.} \end{array}$$

$$88. \frac{21.6}{.66\frac{2}{3}} = 32.4; 32.4 \times 100 = 3240 \text{ rd., Ans.}$$

$$89. \frac{\$14}{.4} = \$35; \$35 \times 100 = \$3500, \text{ Ans.}$$

$$90. \frac{1750}{25} \times 100 = 7000 \text{ lb., Ans.}$$

$$91. 100\% - 40\% = 60\%; \frac{250}{60} \times 100 = \$416\frac{2}{3}.$$

$$\$416\frac{2}{3} - \$250 = \$166\frac{2}{3}, \text{ Ans.}$$

92.

$$100\% - 33\frac{1}{3}\% = 66\frac{2}{3}\%; \frac{\$1600}{66\frac{2}{3}} \times 100 = \$2400, \text{ Ans.}$$

$$93. \frac{\$2250}{75} \times 100 = \$9000, \text{ Ans.}$$

$$94. 100\% + 20\% = 120\%; \frac{2731}{120} \times 100 = 13655, \text{ Ans.}$$

**Article 246.**

102.

$$\$7.75 \times .20 = \$1.55, \text{ Ans.} \quad \$18240 \times .66\frac{2}{3} = \$12160, \text{ Ans.}$$

103.

104.

$$\$400 \times .25 = \$100, \text{ loss; } \$400 - \$100 = \$300, \text{ remainder.}$$

$$\$300 \times .16\frac{2}{3} = \$50, \text{ gain; } \$100 - \$50 = \$50, \text{ loss, Ans.}$$

105.

106.

$$\$69.60 \times .15 = \$10.44, \text{ Ans.} \quad \$350.50 \times .06\frac{1}{2} = \$22.78\frac{1}{2}, \text{ Ans}$$

$$107. \$3500 \times 1.08 = \$3780, \text{ Ans.}$$



$$108. 100\% - 16\% = 84\%; \frac{\$210}{\cancel{84} \atop 21} \times \frac{25}{100} = \$250, \text{ Ans.}$$

109.

$$\$2550 - \$2400 = \$150, \text{ gain; } \frac{75}{\cancel{2400} \atop 24 \atop 12} \text{ of } 100\% = 6\frac{1}{2}\%, \text{ Ans.}$$

$$110. 12 - 8\frac{1}{2} = 3\frac{1}{2} \text{ cents; } \frac{3\frac{1}{2}}{8\frac{1}{2}} = \frac{7}{17} \text{ of } 100\% = 41\frac{2}{7}\%, \text{ Ans.}$$

$$111. \$3312.70 = 105\frac{1}{2}\%; \frac{\$3312.70}{105\frac{1}{2}} \times 100 = \$3140, \text{ Ans.}$$

$$112. 100\% - 12\frac{1}{2}\% = 87\frac{1}{2}\%; \$560 \times .87\frac{1}{2} = \$490, \text{ Ans.}$$

$$113. \$7.50 \times .06 = \$0.45; \$7.50 + \$0.45 = \$7.95.  
\$7.95 \times 1.05 = \$8.34\frac{3}{4}, \text{ Ans.}$$

$$114. \$1600 \times .20 = \$320; \frac{1}{4} \text{ of } \$1600 = \$400.  
\$400 \times .15 = \$60; \$1600 - \$400 = \$1200.  
\$320 - \$60 = \$260; \$1200 + \$260 = \$1460, \text{ Ans.}$$

115.

$$\$28 = 112\%; \frac{\$28}{\cancel{112} \atop 4} \times \frac{25}{100} = \$25, \text{ cost; } \$25 - \$24 = \$1, \text{ loss.}$$

$$\frac{1}{25} \text{ of } 100\% = 4\% \text{ loss, Ans.}$$

$$116. \$50 \times 1.10 = \$55; \frac{4}{5} \text{ of } \frac{24}{120} = 96 \text{ gal.}$$

$$\$55 \div 96 = \$0.57\frac{1}{2}, \text{ Ans.}$$

$$117. \$15 = 90\% ; \frac{\$15}{90} \times 100 = \$16\frac{2}{3}, \text{ cost.}$$

$$\$16\frac{2}{3} \times 1.15 = \$19.16\frac{2}{3}, \text{ Ans.}$$

$$118. \$150 = 90\% ; \frac{\$150}{90} \times 100 = \$166\frac{2}{3}, \text{ cost.}$$

$$\$166\frac{2}{3} \times 1.30 = \$216\frac{2}{3} ; \$216\frac{2}{3} - \$150 = \$66\frac{2}{3}, \text{ Ans.}$$

$$119. \$7250 \times .80 = \$5800 ; \$7250 \times 1.20 = \$8700.$$

$$\$5800 + \$8700 = \$14500. \text{ Neither gain nor lose, Ans.}$$

**Article 248.****123.**

$$\$5678 \times .02\frac{1}{2} = \$141.95, \text{ Ans.}$$

**124.**

$$\$3500 \times .00\frac{1}{4} = \$8.75, \text{ Ans.}$$

$$125. \$7896.50 \times .02 = \$157.93, \text{ Ans.}$$

$$126. 368 \times \$6.50 = \$2392 ; \$2392 \times .02\frac{1}{2} = \$59.80, \text{ Ans.}$$

**127.**

$$\$5000 \times .00\frac{1}{4} = \$12.50 ; \$5000 + \$12.50 = \$5012.50, \text{ Ans.}$$

$$128. \$13500 \times .02\frac{1}{2} = \$337.50 ; \$13500 \times .02 = \$270.$$

$$\$337.50 + \$270 + \$16.50 = \$624.$$

$$\$13500 - \$624 = \$12876, \text{ Ans.}$$

**130.**

$$\$650 = 100\% + 3\% = 103\% ; \frac{\$650}{103} \times 100 = \$631.06+.$$

$$\$650 - \$631.06 = \$18.94, \text{ Ans.}$$

**131.**

$$\$1426.80 = 100\% + 2\frac{1}{4}\% = 102\frac{1}{4}\% ; \frac{\$1426.80}{102\frac{1}{4}} \times 100 = \$1392.$$

$$\$1392 \div \$6.50 = 214\frac{2}{3} \text{ bbl., Ans.}$$

132.  $\$1392 \times 1.02\frac{1}{2} = \$1426.80$ , Ans.

133.  $\$334.75 - \$22.75 = \$312$ , commission.

$$\frac{312}{8134.75} = 3.83\% \text{, Ans.}$$

134.

$\$950 \times .65 = \$617.50$ ;  $\$617.50 \times .06\frac{1}{2} = \$38.59$ , Ans.

135.  $\$208.50 \div .05 = \$4170$ , Ans.

136.

$\$4100 = 102\frac{1}{2}\%$ ;  $\frac{\$4100}{102\frac{1}{2}} \times 100 = \$4000$ , for purchase of iron.

$\$4000 \times .02\frac{1}{2} = \$100$ , commission.

$\$4000 - \$100 = \$3900$ , balance.

$\$4100 - \$3900 = \$200$ , loss, Ans.

### Article 252.

139.  $\$3600 \times .02 = \$72$ ;  $\$72 + \$1 = \$73$ , Ans.

140.  $\$5545 \times .02\frac{1}{2} = \$124.76$ , Ans.

141.  $\frac{3}{4}$  of  $\$68000 = \$51000$ ;  $\$51000 \times .03 = \$1530$ .

$\$1530 + \$1 = \$1531$ , Ans.

142.

$\$55000 \times .02\frac{1}{2} = \$1375$ ;  $\$55000 - \$1375 = \$53625$ , Ans.

143.  $\$27 \div .01\frac{1}{2} = \$1800$ ;  $\$1800 = \frac{3}{4}$  of the value.

$\$1800 \div \frac{3}{4} = \$2400$ , Ans.

144.  $\$73 - \$1 = \$72$ ;  $\$72 \div \$3600 = .02$ , or 2%, Ans.

145.  $74 - 44 = 30$  years;  $\$26.50 \times 15 = \$397.50$ .

$\$397.50 \times 30 = \$11925$ ;  $\$15000 - \$11925 = \$3075$ , Ans.

## MISCELLANEOUS EXERCISES.

146.  $\frac{1}{8}\% = .00125$

$5\% = .05$

$24\% = .24$

$55\% = .55$

$$\begin{array}{r} .84125 \\ \hline \end{array} = 60.25$$

$60.25 \div .84125 = 71\frac{1}{3} + \frac{1}{3}, \text{ Ans.}$

147.  $37 + 3 = 40$  parts.

$$\frac{37}{40} \text{ of } \frac{5}{100}\% = 92\frac{1}{2}\%, \text{ Ans.}$$

$$\frac{3}{40} \text{ of } \frac{5}{100}\% = 7\frac{1}{2}\%, \text{ Ans.}$$

148.  $\$275 + \$180 + \$150 = \$605$ ;  $\$950 - \$605 = \$345$ .

$$\frac{345}{950} \text{ of } 100\% = 36\frac{1}{3}\%, \text{ Ans.}$$

149.

$$\frac{150}{2} = \$0.75; \frac{150}{3} = \$0.50; \$0.75 + \$0.50 = \$1.25, \text{ cost.}$$

$$150 + 150 = 300; \frac{60}{5} \times 2 = \$1.20, \text{ sold for.}$$

$$\$1.25 - \$1.20 = \$0.05, \text{ loss, Ans.}$$

150.  $\$10 \div 12 = \$0.83\frac{1}{3}$ , cost of 1 book.

$$\$1.75 - \$0.83\frac{1}{3} = \$0.91\frac{2}{3}, \text{ gain on 1 book.}$$

$$\frac{91\frac{2}{3}}{83\frac{1}{3}} = \frac{11}{10} \text{ of } 100 = 110\%, \text{ gain, Ans.}$$

151.  $100\% - 25\% = 75\%$ ;  $\$1540 \times .75 = \$1155$ .

$$100\% - 5\% = 95\%; \$1155 \times .95 = \$1097.25, \text{ Ans}$$

152.  $100\% + 5\% = 105\%$ ;  $\$603.75 \div 1.05 = \$575$ .

$$\$575 \div \$5 = 115 \text{ barrels, Ans.}$$

153.  $\$17.25 = 15\%$ ;  $\$17.25 \div .15 = \$115, \text{ Ans.}$

154.  $100\% - 2\% = 98\%$ ;  $\$25640 \div 0.98 = \$26163.26$ , Ans.

155.  $\$4.25 \times .25 = \$1.06\frac{1}{4}$ ;  $\$4.25 + \$1.06\frac{1}{4} = \$5.31\frac{1}{4}$ , Ans.

156.  $\$5 \times 80 = \$400$ , cost;  $100\% - 10\% = 90\%$ .  
 $80 \times .90 = 72$  tons;  $\$400 \div 72 = \$5\frac{5}{6}$ , Ans.

157.  $4500 \times \$1.20 = \cancel{\$5400}$ , cost. *5400*  
 $10\%$  of 4500 bu. = 450 bu.;  $3\%$  of  $\$1.20 = \$0.036$ .  
 $\$1.20 - \$0.036 = \$1.164$ ;  $450 \times \$1.164 = \$523.80$ .  
 $50\%$  of 4500 bu. = 2250 bu.;  $10\%$  of  $\$1.20 = \$0.12$ .  
 $\$120 + \$0.12 = \$1.32$ ;  $2250 \times \$1.32 = \$2970$ .  
 $50\% + 10\% = 60\%$ ;  $100\% - 60\% = 40\%$ .  
 $40\%$  of 4500 bu. = 1800 bu.;  $5\%$  of  $\$1.20 = \$0.06$ .  
 $\$1.20 + \$0.06 = \$1.26$ ;  $1800 \times \$1.26 = \$2268$ .  
 $\$523.80 + \$2970 + \$2268 = \$5761.80$ .  
 $\$5761.80 - \$5400 = \$361.80$ , gain, Ans.

158.  $\$6000 = 66\frac{2}{3}\%$ ;  $\frac{\$6000}{66\frac{2}{3}} \times 100 = \$9000$ , cost.  
 $\$9000 - \$6000 = \$3000$ , loss;  $\$3000 = 32\%$ .

$\frac{\$3000}{\frac{32}{8}} \times \frac{25}{100} = \$9375$ , cost of 2d house.  
 $\$9375 + \$3000 = \$12375$ , Ans.

159.  $\frac{104513}{1652000}$  of  $100\% = 6\frac{5323}{16520}\%$ , Ans.

160.  $\$13195 = 101\frac{1}{2}\%$ ;  $\frac{\$13195}{101\frac{1}{2}} \times 100 = \$13000$ .  
 $\$13195 - \$13000 = \$195$ , Ans.

161.  $\frac{3}{4}$  of  $\$12000 = \$9000$ ;  $\$9000 \times .00\frac{3}{8} = \$33.75$ .  
 $\$12000 - \$9000 = \$3000$ ;  $\$33.75 + \$3000 =$   
 $\$3033.75$ , Ans.

162.  $\$23.25 \div \$930 = .02\frac{1}{2}$ , or  $2\frac{1}{2}\%$ , Ans.

163.  $100\% - 2\frac{1}{2}\% = 97\frac{1}{2}\% = 0.975$ ;  $\$4387.50 \div 0.975 =$   
 $\$4500$ , Ans.

164.  $\$11500 \times .02\frac{1}{2} = \$287.50$ ;  $\$11500 \times .02\frac{1}{2} = \$287.50$   
 $\$287.50 + \$287.50 + \$35 + \$17.25 = \$627.25$ .

$\$11500 - \$627.25 = \$10872.75$ , Ans.

165.  $\$1400 \times .25 = \$350$ , gain;  $\$1400 \times .90 = \$1260$ .

$\$1400 - \$1260 = \$140$ , loss.

$\$350 - \$140 = \$210$ , actual gain.

$\$1400 - \$350 = \$1050$ , original value.

$\$210 \div \$1050 = 20\%$ , actual gain %, Ans.

166.  $100\% - 8\frac{1}{3}\% = 91\frac{1}{3}\%$ ;  $\$920 = 91\frac{1}{3}\%$ .

$\frac{\$920}{91\frac{1}{3}} \times 100 = \$1008.77\frac{1}{3}$ , Ans.

167.  $24 \times .50 = 12$  ft.;  $24 \times 12 = 288$  sq. ft.

$288$  sq. ft.  $= 32$  sq. yd.;  $32 \div \frac{3}{4} = 42\frac{2}{3}$  yd., Ans.

168.  $100\% - 11\% = 89\%$ ;  $133.5$  bbl.  $= 89\%$ .

$133.5$  bbl.  $\div .89 = 150$  bbl., had at first.

$150 \times \$2.50 = \$375$ , cost.

$\$375 \div 133.5 = \$2.80\frac{2}{3}$ , per bbl., Ans.

169.  $500 \times \$10 = \$5000$ ;  $\$5000 - \$4750 = \$250$ .

$\frac{250}{5000} = \frac{1}{20}$  of  $100\% = 5\%$ , Ans.

170.  $\$8000 \times .01\frac{1}{2} = \$120$ ;  $\$15000 \times .00\frac{3}{4} = \$90$ .  
 $\$120 + \$90 = \$210$ ;  $\$15000 + \$8000 = \$23000$ .  
 $\$23000 - \$210 = \$22790$ , Ans.

171.  $55\% - 24\% = 31\%$ ;  $60.45 = 31\%$ .  
 $60.45 \div .31 = 195$ , Ans.

172.  $20 \times 12 \times 4 = 960$  cu. ft., or  $7\frac{1}{2}$  cd.  
 $7\frac{1}{2} \times \$5 = \$37\frac{1}{2}$ ;  $\$50 - \$37\frac{1}{2} = \$12\frac{1}{2}$ .  

$$\frac{12\frac{1}{2}}{37\frac{1}{2}} = \frac{\frac{25}{2}}{\frac{75}{2}} \times \frac{2}{75} = \frac{1}{3} \text{ of } 100\% = 33\frac{1}{3}\%, \text{ Ans.}$$

173.  $4 \text{ ft.} = 48 \text{ in.}$ ;  $48 \text{ in.} - 44 \text{ in.} = 4 \text{ in.}$   
 $\frac{4}{48}$  or  $\frac{1}{12}$  of  $\$30 = \$2.50$ , Ans.

174.  $4 \times 5 \times 2 = 40$  sessions in 4 weeks.  
 $120 \div 40 = 3$ , absent each session.  
 $400 - 3 = 397$ , present each session.  

$$\frac{397}{400} \text{ of } 100\% = 99\frac{1}{4}\%, \text{ Ans.}$$

175.  $\$2.50 \times .20 = \$0.50$ ;  $\$2.50 + \$0.50 = \$3$ , sold for.  
 $\$3 = 75\%$  of marked price;  $\$3 \div .75 = \$4$ , Ans.

176.  $62\frac{3}{8} - 57\frac{1}{2} = 4\frac{7}{8} \text{ lb.}$ ;  $\frac{4\frac{7}{8}}{62\frac{3}{8}} = \frac{39}{499}$  of  $100\% = 7\frac{497}{499}\%$ , Ans

177.  $100\% + 69\% = 169\%$ ;  $503620 = 169\%$ .  

$$\frac{503620}{169} \times 100 = 298000, \text{ Ans.}$$

**Article 259.**

12. \$ 1728 = Principal.

.06 = Rate.

$\$103.68 = 1 \text{ year's int.}$

$\begin{array}{r} 3\frac{1}{2} \\ \hline \end{array}$

31104

7776

$\$388.80 = \text{Interest.}$

1728.00 = Principal.

Ans.  $\$2116.80 = \text{Amount.}$

13. \$ 144 = Principal.

.05 = Rate.

$\$7.20 = 1 \text{ year's int}$

$\begin{array}{r} 1\frac{1}{2} \\ \hline \end{array}$

720

480

Ans.  $\$12.00 = \text{Interest.}$

16. \$ 1500 = Principal.

.06 = Rate.

$\$90.00 = 1 \text{ year's interest.}$

$\begin{array}{r} 2\frac{1}{2} \\ \hline \end{array}$

18000

4875

$\$228.75 = \text{Interest.}$

1500.00

Ans.  $\$1728.75 = \text{Amount.}$

**Article 260.**

17. \$ 2464 = Principal.

.05 = Rate.

$\$123.20 = 1 \text{ year's int.}$

$\begin{array}{r} 2\frac{1}{2} \\ \hline \end{array}$

24640

9753 $\frac{1}{2}$

Ans.  $\$343.93\frac{1}{2} = \text{Interest.}$

18. \$ 2503.75 = Principal.

.06 = Rate.

$\$150.2250 = 1 \text{ year's int.}$

$\begin{array}{r} 3\frac{1}{2} \\ \hline \end{array}$

4506750

1339506

Ans.  $\$584.6256 = \text{Interest.}$



19. \$ 560.50 = Principal.

.07 = Rate.

$\$ 39.2350 = 1 \text{ year's int.}$

$\begin{array}{r} 4\frac{1}{8} \\ \hline 1569400 \end{array}$

10898

Ans. \$ 158.0298 = Interest.

20. \$ 97.16 = Principal.

.06 = Rate.

$\$ 5.8296 = 1 \text{ year's int.}$

$\begin{array}{r} 1\frac{1}{2} \\ \hline 58296 \end{array}$

24290

Ans. \$ 8.2586 = Interest.

21. \$ 156.80 = Principal.

.04 = Rate.

$\$ 6.2720 = 1 \text{ year's int.}$

$\begin{array}{r} 3\frac{1}{2} \\ \hline 188160 \end{array}$

188160

5749

Ans. \$ 19.3909 = Interest.

22. \$ 865 = Principal.

.08 = Rate.

$\$ 69.20 = 1 \text{ year's int.}$

$\begin{array}{r} 1\frac{1}{2} \\ \hline 6920 \end{array}$

6920

5651

Ans. \$ 125.71 = Interest.

23. \$ 890 = Principal.

.06 = Rate.

$\$ 53.40 = 1 \text{ year's int.}$

$\begin{array}{r} 5\frac{1}{2} \\ \hline 26700 \end{array}$

26700

3233

Ans. \$ 299.33 = Interest.

24. \$ 5000 = Principal.

.07 = Rate.

$\$ 350.00 = 1 \text{ year's int.}$

$\begin{array}{r} 3\frac{1}{2} \\ \hline 105000 \end{array}$

105000

33055

$\$ 1380.55\frac{1}{2} = \text{Interest.}$

5000.00

Ans. \$ 6380.55 $\frac{1}{2}$  = Amount.

**Article 262.**

28.

2) \$ 56.80 = Principal.

.2840 = 1 mo.'s int.

$20\frac{1}{4} = \text{Time in mo.}$

$\begin{array}{r} 56800 \end{array}$

1609 $\frac{1}{2}$

Ans. \$ 5.8409 $\frac{1}{2}$  = Interest.

29.

2) \$ 6000 = Principal.

30.00 = 1 mo.'s int.

50 = Time in mo.

Ans. \$ 1500.00 = Interest.

**30.**

$$\begin{array}{r}
 2) \$ 17.28 = \text{Principal.} \\
 \underline{.0864} = 1 \text{ mo.'s int.} \\
 23\frac{1}{10} = \text{Time in mo.} \\
 \underline{2592} \\
 1728 \\
 86\frac{2}{3}
 \end{array}$$

$$\text{Ans. } \$ 1.9958\frac{2}{3} = \text{Interest.}$$

**31.**

$$\begin{array}{r}
 2) \$ 1850.75 = \text{Principal.} \\
 \underline{9.25375} = 1 \text{ mo.'s int.} \\
 9\frac{1}{2} = \text{Time in mo.} \\
 \underline{740300} \\
 8328375
 \end{array}$$

$$\text{Ans. } \$ 90.686\frac{1}{2} = \text{Interest.}$$

**32.**

$$\begin{array}{r}
 2) \$ 253.50 = \text{Principal.} \\
 \underline{1.2675} = 1 \text{ mo.'s int.} \\
 28\frac{7}{10} = \text{Time in mo.} \\
 \underline{2957\frac{1}{2}} \\
 101400 \\
 25350
 \end{array}$$

$$\text{Ans. } \$ 35.7857\frac{1}{2} = \text{Int.}$$

**33.**

$$\begin{array}{r}
 2) \$ 85.90 = \text{Principal.} \\
 \underline{.4295} = 1 \text{ mo.'s int.} \\
 42\frac{9}{10} = \text{Time in mo.} \\
 \underline{8590} \\
 17180 \\
 3865\frac{1}{2}
 \end{array}$$

$$\text{Ans. } \$ 18.4255\frac{1}{2} = \text{Interest.}$$

**34.**

$$\begin{array}{r}
 2) \$ 1992.25 = \text{Principal.} \\
 \underline{9.96125} = 1 \text{ mo.'s int.} \\
 3\frac{1}{10} = \text{Time in mo.} \\
 \underline{2988375} \\
 99612\frac{1}{2}
 \end{array}$$

$$\text{Ans. } \$ 30.87987\frac{1}{2} = \text{Interest.}$$

**35.**

$$\begin{array}{r}
 2) \$ 15600 = \text{Principal.} \\
 \underline{78.00} = 1 \text{ mo.'s int.} \\
 55\frac{1}{2} = \text{Time in mo.} \\
 \underline{39000} \\
 39000 \\
 4940
 \end{array}$$

$$\text{Ans. } \$ 4339.40 = \text{Interest.}$$

**36.**

$$\begin{array}{r}
 2) \$ 1400 = \text{Principal.} \\
 \underline{\$ 7.00} = 1 \text{ mo.'s int.} \\
 30 = \text{Time in mo.} \\
 \underline{\$ 210.00} = \text{Interest.} \\
 1400. = \text{Principal.}
 \end{array}$$

$$\text{Ans. } \$ 1610.00 = \text{Amount.}$$

**37.**

$$\begin{array}{r}
 2) \$ 7000 = \text{Principal.} \\
 \underline{35.00} = 1 \text{ mo.'s int.} \\
 63 = \text{Time in mo.} \\
 \underline{10500} \\
 21000
 \end{array}$$

$$\$ 2205.00 = \text{Int.}$$

$$7000. = \text{Principal.}$$

$$\text{Ans. } \$ 9205.00 = \text{Amount.}$$

**Article 263.****38.**

$$\begin{array}{r}
 2) \$545 = \text{Principal.} \\
 \underline{2.725} = 1 \text{ mo.'s int.} \\
 8\frac{1}{2} = \text{Time in mo.} \\
 \underline{21800} \\
 2180 \\
 3) 23.980 = \text{Int. at 6\%} \\
 \underline{7.993\frac{1}{3}} = \text{" 2\%} \\
 \text{Ans. } \$15.986\frac{2}{3} = \text{" 4\%}
 \end{array}$$

**39.**

$$\begin{array}{r}
 2) \$78.50 = \text{Principal.} \\
 \underline{.3925} = 1 \text{ mo.'s int.} \\
 4\frac{1}{10} = \text{Time in mo.} \\
 \underline{15700} \\
 392\frac{1}{2} \\
 6) 1.6092\frac{1}{2} = \text{Int. at 6\%} \\
 \underline{.2682\frac{1}{2}} = \text{" 1\%} \\
 \text{Ans. } \$1.3410\frac{1}{2} = \text{" 5\%}
 \end{array}$$

**40.**

$$\begin{array}{r}
 2) \$64.70 = \text{Principal.} \\
 \underline{.3235} = 1 \text{ mo.'s int.} \\
 29 = \text{Time in mo.} \\
 \underline{29115} \\
 6470 \\
 6) 9.3815 = \text{Int. at 6\%} \\
 \underline{1.5635\frac{5}{6}} = \text{" 1\%} \\
 \text{Ans. } \$10.9450\frac{5}{6} = \text{" 7\%}
 \end{array}$$

**41.**

$$\begin{array}{r}
 2) \$1440 = \text{Principal.} \\
 \underline{7.20} = 1 \text{ mo.'s int.} \\
 11\frac{3}{8} = \text{Time in mo.} \\
 \underline{720} \\
 720 \\
 552 \\
 4) 84.72 = \text{Int. at 6\%} \\
 \underline{21.18} = \text{" } 1\frac{1}{2}\% \\
 \text{Ans. } \$63.54 = \text{" } 4\frac{1}{2}\%
 \end{array}$$

**42.**

$$\begin{array}{r}
 2) \$9500 = \text{Principal.} \\
 \underline{47.50} = 1 \text{ mo.'s int.} \\
 42\frac{1}{10} = \text{Time in mo.} \\
 \underline{9500} \\
 19000 \\
 2691\frac{3}{4} \\
 6) 2021.91\frac{3}{4} = \text{Int. at 6\%} \\
 \underline{336.98\frac{1}{4}} = \text{" 1\%} \\
 \text{Ans. } \$2358.90\frac{1}{4} = \text{" 7\%}
 \end{array}$$

**43.**

$$\begin{array}{r}
 2) \$600.80 = \text{Principal.} \\
 \underline{3.0040} = 1 \text{ mo.'s int.} \\
 35\frac{1}{10} = \text{Time in mo.} \\
 \underline{150200} \\
 90120 \\
 3004 \\
 3) 105.4404 = \text{Int. at 6\%} \\
 \underline{35.1468} = \text{" 2\%} \\
 \text{Ans. } \$140.5872 = \text{" 8\%}
 \end{array}$$

44.

$$\begin{array}{r}
 2) \$20000 = \text{Principal.} \\
 \underline{100.00} = 1 \text{ mo.'s int.} \\
 2\frac{1}{10} = \text{Time in mo.} \\
 \underline{20000} \\
 1000 \\
 6) \underline{210.00} = \text{Int. at 6 \%} \\
 35.00 = \text{ " } 1 \% \\
 \text{Ans. } \$175.00 = \text{ " } 5 \%
 \end{array}$$

45.

$$\begin{array}{r}
 2) \$340.90 = \text{Principal.} \\
 \underline{1.7045} = 1 \text{ mo.'s int.} \\
 55\frac{11}{30} = \text{Time in mo.} \\
 \underline{85225} \\
 85225 \\
 6249\frac{4}{5} \\
 6) \underline{94.3724} = \text{Int. at 6 \%} \\
 15.7287\frac{4}{5} = \text{ " } 1 \% \\
 \text{Ans. } \$110.1012 = \text{ " } 7 \%
 \end{array}$$

46.

$$\begin{array}{r}
 2) \$15420 = \text{Principal.} \\
 \underline{77.10} = 1 \text{ mo.'s int.} \\
 9\frac{3}{4} = \text{Time in mo.} \\
 \underline{69390} \\
 6168 \\
 12) \underline{755.58} = \text{Int. at 6 \%} \\
 62.965 = \text{ " } \frac{1}{2} \% \\
 \text{Ans. } \$818.545 = \text{ " } 6\frac{1}{2} \%
 \end{array}$$

47.

$$\begin{array}{r}
 2) \$374.75 = \text{Principal.} \\
 \underline{1.87375} = 1 \text{ mo.'s int.} \\
 45 = \text{Time in mo.} \\
 \underline{936875} \\
 749500 \\
 3) \underline{84.31875} = \text{Int. at 6 \%} \\
 28.10625 = \text{ " } 2 \% \\
 \text{Ans. } \$112.42500 = \text{ " } 8 \%
 \end{array}$$

48. Time = 1 y. 1 mo. 11 d.

$$\begin{array}{r}
 2) \$525 = \text{Principal.} \\
 \underline{2.625} = 1 \text{ mo.'s int.} \\
 13\frac{11}{30} = \text{Time in mo.} \\
 \underline{7875} \\
 2625 \\
 962\frac{1}{2} \\
 6) \underline{35.087\frac{1}{2}} = \text{Int. at 6 \%} \\
 5847\frac{11}{30} = \text{ " } 1 \% \\
 \$40.935\frac{1}{2} = \text{ " } 7 \% \\
 525. \\
 \text{Ans. } \$565.935 = \text{Amount.}
 \end{array}$$

49. Time = 1 y. 9 mo. 26 d.

$$\begin{array}{r}
 2) \$450.60 = \text{Principal.} \\
 \underline{2.2530} = 1 \text{ mo.'s int.} \\
 21\frac{13}{30} = \text{Time in mo.} \\
 \underline{22530} \\
 45060 \\
 19526 \\
 6) \underline{49.2656} = \text{Int. at 6 \%} \\
 8.2109 = \text{ " } 1 \% \\
 \$57.4765 = \text{ " } 7 \% \\
 450.60 \\
 \text{Ans. } \$508.0765 = \text{Amount.}
 \end{array}$$

**Article 264.**

52. Time = 132 d.      \$ 66.42 = Principal.  
 Interest for 60 d. =  $\frac{.6642}{60} = .01$  of principal.  
 " " 60 " =  $\frac{.6642}{60} = .01$  " "  
 " " 12 " =  $\frac{.13284}{12} = \frac{1}{10}$  of 60 days' interest.  
 " " 132 d. = \$ 1.46124 at 6%.  
 " " " = 0.24354 " 1%.  
 " " " = \$ 1.21770 " 5%, Ans.

53. Time = 93 d.      \$ 8000 = Principal.  
 Interest for 60 d. =  $\frac{80.00}{60} = .01$  of principal.  
 " " 30 " =  $\frac{40.00}{30} = \frac{1}{3}$  of 60 days' interest.  
 " " 3 " =  $\frac{4.00}{3} = \frac{1}{10}$  of 30 days' interest.  
 " " 93 d. = \$ 124.00 at 6%.  
 " " " = 20.66 $\frac{2}{3}$  " 1%.  
 " " " = \$ 144.66 $\frac{2}{3}$  " 7%, Ans.

54. Time = 45 d.      \$ 130.50 = Principal.  
 Interest for 60 " =  $\frac{1.305}{60} = .01$  of principal.  
 " " 30 d. =  $\frac{.6525}{30} = \frac{1}{3}$  of 60 days' interest.  
 " " 15 " =  $\frac{.32625}{15} = \frac{1}{3}$  " 30 " "  
 " " 45 d. =  $\frac{.97875}{45} = .01$  at 6%.  
 " " " =  $\frac{.32625}{3} = .01$  " 2%.  
 " " " = \$ 1.30500 " 8%, Ans.

55. Time = 81 d.      \$ 7500 = Principal.  
 Interest for 60 d. =  $\frac{75.00}{60} = .01$  of principal.  
 " " 20 " =  $\frac{25.00}{20} = \frac{1}{3}$  of 60 days' interest.  
 " " 1 " =  $\frac{1.25}{1} = \frac{1}{80}$  of 20 days' interest.  
 " " 81 d. = \$ 101.25 at 6%, Ans.

56. 1 y. 3 mo. 6 d. = 456 d.

$$\begin{array}{rcl}
 \text{Time} = & \underline{456 \text{ d.}} & \$225 = \text{Principal.} \\
 \text{Interest for } 60 \text{ d.} = & 2.25 & = .01 \text{ of principal.} \\
 \text{" " } 360 \text{ " } = & 13.50 & = 6 \times 60 \text{ days' interest.} \\
 \text{" " } 30 \text{ " } = & 1.125 & = \frac{1}{2} \text{ of " " " } \\
 \text{" " } 6 \text{ " } = & .225 & = \frac{1}{8} \text{ " } 30 \text{ " " } \\
 \text{" " } 456 \text{ d.} = & \$17.100 & \text{at 6\%, Ans.}
 \end{array}$$

57. 3 mo. 15 d. = 105 d.

$$\begin{array}{rcl}
 \text{Time} = & \underline{105 \text{ d.}} & \$163.20 = \text{Principal.} \\
 \text{Interest for } 60 \text{ d.} = & \$1.632 & = .01 \text{ of principal.} \\
 \text{" " } 30 \text{ " } = & .816 & = \frac{1}{2} \text{ of 60 days' interest.} \\
 \text{" " } 15 \text{ " } = & .408 & = \frac{1}{2} \text{ " } 30 \text{ " " } \\
 \text{" " } 105 \text{ d.} = & \$2.856 & \text{at 6\%.} \\
 \text{" " " } = & .476 & \text{" 1\%.} \\
 \text{" " " } = & \$4.760 & \text{" 10\%.} \\
 & \underline{163.20} & \\
 \text{Ans. } & \$167.960, & \text{Amount.}
 \end{array}$$

58. 1 y. 1 mo. 23 d. = 413 d.

$$\begin{array}{rcl}
 \text{Time} = & \underline{413 \text{ d.}} & \$900.65 = \text{Principal.} \\
 \text{Interest for } 60 \text{ d.} = & 9.0065 & = .01 \text{ of principal.} \\
 \text{" " } 300 \text{ " } = & 45.0325 & = 5 \times 60 \text{ days' interest.} \\
 \text{" " } 30 \text{ " } = & 4.5032 & = \frac{1}{2} \text{ of " " " } \\
 \text{" " } 20 \text{ " } = & 3.0021 & = \frac{2}{3} \text{ " } 30 \text{ " " } \\
 \text{" " } 3 \text{ " } = & .4503 & = \frac{1}{10} \text{ " " " } \\
 \text{" " } 413 \text{ d.} = & \$61.9946 & \text{at 6\%.} \\
 & \underline{900.65} & \\
 \text{Ans. } & \$962.6446 & = \text{Amount.}
 \end{array}$$

59. 1 y. 1 mo. 12 d. = 402 d.

Time =	<u>402 d.</u>	\$ 4000	= Principal.
Interest for	60 d. =	\$ 40.00	= .01 of principal.
"	" 300 "	= 200.00	= 5 × 60 days' interest.
"	" 40 "	= 26.666 $\frac{2}{3}$	= $\frac{2}{3}$ of " " "
"	" 2 "	= 1.333 $\frac{1}{3}$	= $\frac{1}{30}$ " 40 " "
"	" 402 d. =	\$ 268.00	at 6%.
"	" " =	67.00	" 1 $\frac{1}{2}$ %.
"	" " =	\$ 201.00	" 4 $\frac{1}{3}$ %, Ans.

60. 2 y. 8 mo. 29 d. = 989 d.

Time =	<u>989 d.</u>	\$ 653.63	= Principal.
Interest for	60 d. =	6.5363	= .01 of principal.
"	" 900 "	= 98.0445	= 15 × 60 days' interest
"	" 20 "	= 2.1787	= $\frac{1}{3}$ of " " "
"	" 5 "	= .5446	= $\frac{1}{6}$ " 20 " "
"	" 4 "	= .4357	= $\frac{1}{15}$ " 20 " "
"	" 989 d. =	\$ 107.7398	at 6%.
"	" " =	17.9566	" 1%.
"	" " =	\$ 125.6964	" 7%.
		<u>653.63</u>	
	Ans.	\$ 779.3264	Amount.

61. Time = 60 d. \$ 4498.25 = Principal.

Interest for 60 d. = \$ 44.9825 = .01 of principal.

7.4970 at 1%.

Interest for 60 d. = \$ 37.4855 " 5%.

4498.25

Ans. \$ 4535.7355 = Amount.

62. \$ 248 = Principal.

.03½ = Rate.

744

124

\$ 8.68 = 1 year's interest.

0½

Ans. \$ 4.774 = Interest at 3½ %.

63. \$ 845 = Principal.

.04 = Rate.

\$ 33.80 = 1 year's int.

13½

10140

3380

685½

Ans. \$ 446.25 = Int. at 4 %.

64.

2 ) \$ 245.80 = Principal.

1.2290 = 1 mo.'s int.

29⅞ = Time in mo.

110610

24580

2867

\$ 35.9277 = Int. at 6 %.

8.9819 = " 1½ %

Ans. \$ 26.9458 = " 4½ %.

65.

2 ) \$ 960 = Principal.

4.80 = 1 mo.'s int.

43⅞ = Time in mo.

1440

1920

144

\$ 207.84 = Int. at 6 %.

34.64 = " 1 %.

Ans. \$ 173.20 = " 5 %.

66.

2 ) \$ 849.50 = Principal.

4.2475 = 1 mo.'s int.

100⅔ = Time in mo.

4247500

16990

Ans. \$ 426.4490 = Int. at 6 %.

67.

2 ) \$ 2846 = Principal.

14.23 = 1 mo.'s int.

. 41½ = Time in mo.

1423

5692

4743

\$ 588.173 = Int. at 6 %.

49.014 = " ½ %.

Ans. \$ 637.187 = " 6½ %.



68.

$$\begin{array}{r}
 2) \$180 = \text{Principal.} \\
 \underline{.90} = 1 \text{ mo.'s int.} \\
 21\frac{1}{2} = \text{Time in mo.} \\
 \underline{90} \\
 180 \\
 \underline{45} \\
 \$19.35 = \text{Int. at 6 \%} \\
 3.225 = \text{ " 1 \%} \\
 \text{Ans. } \$22.575 = \text{ " 7 \%}
 \end{array}$$

69.

$$\begin{array}{r}
 2) \$948.39 = \text{Principal.} \\
 \underline{4.74195} = 1 \text{ mo.'s int.} \\
 47\frac{1}{2} = \text{Time in mo.} \\
 \underline{3319365} \\
 1896780 \\
 \underline{94839} \\
 \$223.82004 = \text{Int. at 6 \%} \\
 55.95501 = \text{ " 1}\frac{1}{2} \% \\
 \text{Ans. } \$279.77505 = \text{ " 7}\frac{1}{2} \%
 \end{array}$$

70.

$$\begin{array}{r}
 2) \$862 = \text{Principal.} \\
 \underline{4.31} = 1 \text{ mo.'s int.} \\
 55\frac{1}{2} = \text{Time in mo.} \\
 \underline{2155} \\
 2155 \\
 \underline{316} \\
 \$240.21 = \text{Int. at 6 \%} \\
 80.07 = \text{ " 2 \%} \\
 \text{Ans. } \$320.28 = \text{ " 8 \%}
 \end{array}$$

71.

$$\begin{array}{r}
 2) \$1500 = \text{Principal.} \\
 \underline{7.50} = 1 \text{ mo.'s int.} \\
 15\frac{1}{10} = \text{Time in mo.} \\
 \underline{3750} \\
 750 \\
 \underline{675} \\
 \$119.25 = \text{Int. at 6 \%} \\
 59.625 = \text{ " 3 \%} \\
 \text{Ans. } \$178.87\frac{1}{2} = \text{ " 9 \%}
 \end{array}$$

72.

$$\begin{array}{r}
 2) \$8400 = \text{Principal.} \\
 \underline{42.00} = 1 \text{ mo.'s int.} \\
 2\frac{1}{3} = \text{Time in mo..} \\
 \underline{8400} \\
 2380 \\
 \underline{107.80} = \text{Int. at 6 \%} \\
 23.35\frac{2}{3} = \text{ " 1.3 \%} \\
 \text{Ans. } \$131.15\frac{2}{3} = \text{ " 7.3 \%}
 \end{array}$$

73.

$$\begin{array}{r}
 2) \$9398 = \text{Principal.} \\
 \underline{46.99} = 1 \text{ mo.'s int.} \\
 1\frac{1}{2} = \text{Time in mo.} \\
 \underline{4699} \\
 28194 \\
 \underline{75.184} = \text{Int. at 6 \%} \\
 50.122 = \text{ " 4 \%} \\
 \text{Ans. } \$125.306 = \text{ " 10 \%}
 \end{array}$$

74.

$$\begin{array}{r}
 2) \$479.85 = \text{Principal.} \\
 \underline{2.39925} = 1 \text{ mo.'s int.} \\
 3\frac{8}{15} = \text{Time in mo.} \\
 \underline{719775} \\
 127960 \\
 \$8.47735 = \text{Int. at 6\%} \\
 1.41289 = \text{ " } 1\% \\
 \text{Ans. } \$7.06446 = \text{ " } 5\%
 \end{array}$$

75.

$$\begin{array}{r}
 2) \$948.25 = \text{Principal.} \\
 \underline{4.74125} = 1 \text{ mo.'s int.} \\
 2\frac{3}{8} = \text{Time in mo.} \\
 \underline{948250} \\
 458320 \\
 \$14.06570 = \text{Int. at 6\%} \\
 3.51642 = \text{ " } 1\frac{1}{2}\% \\
 \text{Ans. } \$10.54928 = \text{ " } 4\frac{1}{2}\%
 \end{array}$$

76.

$$\begin{array}{r}
 2) \$84.32 = \text{Principal.} \\
 \underline{.4216} = 1 \text{ mo.'s int.} \\
 1\frac{1}{2} = \text{Time in mo.} \\
 \underline{4216} \\
 2108 \\
 \$0.6324 = \text{Int. at 6\%} \\
 0.2108 = \text{ " } 2\% \\
 \text{Ans. } \$0.4216 = \text{ " } 4\%
 \end{array}$$

77.

$$\begin{array}{r}
 2) \$961.18 = \text{Principal.} \\
 \underline{4.8059} = 1 \text{ mo.'s int.} \\
 3\frac{7}{10} = \text{Time in mo.} \\
 \underline{144177} \\
 33641 \\
 \text{Ans. } \$17.7818 = \text{Int. at 6\%}
 \end{array}$$

78.

$$\begin{array}{r}
 \text{Time} = 4 \text{ mo. } 21 \text{ d.} \\
 2) \$549.82 = \text{Principal.} \\
 \underline{2.7491} = 1 \text{ mo.'s int.} \\
 4\frac{7}{10} = \text{Time in mo.} \\
 \underline{109964} \\
 19243 \\
 \$12.9207 = \text{Int. at 6\%} \\
 6.4603 = \text{ " } 3\% \\
 \$19.3810 = \text{ " } 9\% \\
 549.82 \\
 \text{Ans. } \$569.2010 = \text{Amount.}
 \end{array}$$

79.

$$\begin{array}{r}
 \text{Time} = 7 \text{ mo. } 18 \text{ d.} \\
 2) \$856.84 = \text{Principal.} \\
 \underline{4.2842} = 1 \text{ mo.'s int.} \\
 7\frac{3}{8} = \text{Time in mo.} \\
 \underline{299894} \\
 25705 \\
 \$32.5599 = \text{Int. at 6\%} \\
 10.8533 = \text{ " } 2\% \\
 \$43.4132 = \text{ " } 8\% \\
 856.84 \\
 \text{Ans. } \$900.2532 = \text{Amount.}
 \end{array}$$

**80.**

Time = 2 mo. 7 d.

2) \$1248 = Principal.

6.24 = 1 mo.'s int.

 $2\frac{7}{10}$  = Time in mo.

1248

1456

\$13.936 = Int. at 6%.

1248.

Ans. \$1261.936 = Amount.

**81.**

Time = 1 y. 6 mo. 4 d.

2) \$960.50 = Principal.

4.8025 = 1 mo.'s int.

 $18\frac{2}{3}$  = Time in mo.

384200

48025

6403 $\frac{1}{2}$ 

\$87.0853 = Int. at 6%.

21.7713 = " 1 $\frac{1}{2}$ %.\$65.3140 = " 4 $\frac{1}{2}$ %.

960.50

Ans. \$1025.8140 = Amount.

**82.**

Time = 3 mo. 6 d.

2) \$849.25 = Principal.

4.24625 = 1 mo.'s int.

 $3\frac{1}{2}$  = Time in mo.

1273875

84925

\$13.58800 = Int. at 6%.

2.26466 $\frac{2}{3}$  = " 1%.\$11.32333 $\frac{1}{3}$  = " 5%.

849.25

Ans. \$860.57333 $\frac{1}{3}$  = Amount.**83.**

Time = 2 y. 4 mo. 14 d.

2) \$562.75 = Principal.

2.81375 = 1 mo.'s int.

 $28\frac{7}{8}$  = Time in mo.

2251000

562750

131308

\$80.09808 = Int. at 6%.

13.34968 = " 1%.

\$93.44776 = " 7%.

562.75

Ans. \$656.19776 = Amount.

**84.**

Time = 7 mo. 5 d.

2) \$476.84 = Principal.

2.3842 = 1 mo.'s int.

7½ = Time in mo.

166894

3973

\$17.0867 = Int. at 6 %.

4.2716 = " 1½ %.

\$21.3583 = " 7½ %.

476.84

Ans. \$498.1983 = Amount.

**85.**

Time = 3 mo. 29 d.

2) \$942 = Principal.

4.71 = 1 mo.'s int.

3½ = Time in mo.1413

4553

\$18.683 = Int. at 6 %.

7.784 = " 2½ %.

\$10.899 = " 3½ %.

942.00

Ans. \$952.899 = Amount.

**86.**

Time = 1 y. 8 mo. 25 d.

2) \$1728 = Principal.

8.64 = 1 mo.'s int.

20½ = Time in mo.

17280

720

\$180.00 = Int. at 6 %.

60.00 = " 2 %.

\$240.00 = " 8 %.

1728.00

Ans. \$1968.00 = Amount.

**87.**

Time = 3 mo. 6 d.

2) \$945.96 = Principal.

4.7298 = 1 mo.'s int.

3½ = Time in mo.141894

94596

\$15.13536 = Int. at 6 %.

7.56768 = " 3 %.

\$22.70304 = " 9 %.

945.96

Ans. \$968.66304 = Amount.

**88.**

Time = 2 mo. 27 d.

2) \$ 200 = Principal.

1.00 = 1 mo.'s int.2 $\frac{9}{10}$  = Time in mo.200**90**

\$ 2.900 = Int. at 6 %.

0.4833 $\frac{1}{3}$  = " 1 %.\$ 4.833 $\frac{1}{3}$  = " 10 %.200.00Ans. \$ 204.833 $\frac{1}{3}$  = Amount.**89.**

Time = 1 y. 5 mo. 27 d.

2) \$ 816.42 = Principal.

4.0821 = 1 mo.'s int.17 $\frac{9}{10}$  = Time in mo.2857474082136738

\$ 73.0695 = Int. at 6 %.

12.1782 = " 1 %.

\$ 85.2477 = " 7 %.

816.42

Ans. \$ 901.6677 = Amount.

**90.**

Time = 4 y. 5 mo.

2) \$ 945.55 = Principal.

4.72775 = 1 mo.'s int.53 = Time in mo.14183252363875

\$ 250.57075 = Int. at 6 %.

41.76179 = " 1 %.

\$ 292.33254 = " 7 %.

945.55

Ans. \$ 1237.88254 = Am't.

**91.**

Time = 3 mo. 11 d.

2) \$ 624.87 = Principal.

3.12435 = 1 mo.'s int.3 $\frac{11}{10}$  = Time in mo.937305114559

\$ 10.51864 = Int. at 6 %.

1.75310 = " 1 %.

\$ 8.76554 = " 5 %.

624.87

Ans. \$ 633.63554 = Amount.

**Article 265.****93.** Time = 111 days. \$ 3000  $\times$  .05 = \$ 150.

$$\begin{array}{r} 30 \\ \$ 150 \times 111 \\ \hline 365 \\ 73 \end{array} = \$ 45.62, \text{ Ans.}$$

94. Time = 134 days.  $\$1000 \times .04\frac{1}{2} = \$45.$

$$\begin{array}{r} 9 \\ \$45 \times 134 \\ \hline 365 \\ 73 \end{array} = \$16.52, \text{ Ans.}$$

95. Time = 303 days.  $\$225.50 \times .06 = \$13.53.$

$$\frac{\$13.53 \times 303}{365} = \$11.23; \$225.50 + \$11.23 = \$236.73, \text{ Ans.}$$

97.

$$\$250 \times .01 \times 1\frac{1}{2} = \$3.125; \$28.12\frac{1}{2} \div \$3.125 = 9\%, \text{ Ans.}$$

### Article 266.

98.  $\$1400 \times .01 \times 1\frac{1}{2} = \$21; \$126 \div \$21 = 6\%, \text{ Ans.}$

99.  $\$1000 \times .01 \times 4\frac{7}{10} = \$47; \$282 \div \$47 = 6\%, \text{ Ans.}$

100.  $\$416 \times .01 \times 3\frac{2}{5} = \$12.66\frac{2}{3};$

$$\$88.64 \div \$12.66\frac{2}{3} = 6\frac{1}{7}\frac{1}{3}\%, \text{ Ans.}$$

101.

$$\$1600 \times .01 \times \frac{1}{10} = \$2.93\frac{1}{3}; \$46.20 \div \$2.93\frac{1}{3} = 15\frac{3}{4}\%, \text{ Ans.}$$

102.  $\$250.58 - \$241.20 = \$9.38.$

$$\$241.20 \times .01 \times \frac{5}{9} = \$1.34; \$9.38 \div \$1.34 = 7\%, \text{ Ans.}$$

103.

$$\$480 \times .01 \times 2\frac{1}{2} = \$11.60; \$52.20 \div \$11.60 = 4\frac{1}{2}\%, \text{ Ans.}$$

104. Time = 2 mo. 6 d.

$$\$640 \times .01 \times \frac{11}{60} = \$1.17\frac{1}{3}; \$10.56 \div \$1.17\frac{1}{3} = 9\%, \text{ Ans.}$$

105.  $\$1084 - \$960 = \$124$ , interest.

$\$960 \times .01 \times 1\frac{7}{4} = \$12.40$ ;  $\$124 \div \$12.40 = 10\%$ , Ans.

106.  $\$444 \times .01 \times 6\frac{1}{2} = \$28.49$ ;  $\$156.695 \div \$28.49 = 5\frac{1}{2}\%$ , Ans.

107.  $\$500 \times 2 = \$1000$ , interest;  $\$25000 \times .01 \times 1 = \$250$ .  
 $\$1000 \div \$250 = 4\%$ , Ans.

109.  $\$140 \times .07 = \$9.80$ ;  $\$49.00 \div \$9.80 = 5$  years, Ans.

### Article 267.

110.  $\$98 \times .08 = \$7.84$ ;  $\$23.48 \div \$7.84 = 2\frac{11}{14}$ .

$2\frac{11}{14}$  y. = 2 y. 11 mo.  $28\frac{8}{7}$  d., Ans.

111.  $\$75 \times .06 = \$4.50$ ;  $\$6.25 \div \$4.50 = 1\frac{7}{9}$ .

$1\frac{7}{9}$  y. = 1 y. 4 mo. 20 d., Ans.

112.  $\$3600 \times .07 = \$252$ ;  $\$46.20 \div \$252 = \frac{11}{60}$ .

$\frac{11}{60}$  y. = 2 mo. 6 d., Ans.

113.  $\$875 \times .06 = \$52.50$ ;  $\$7.00 \div \$52.50 = \frac{2}{15}$ .

$\frac{2}{15}$  y. = 1 mo. 18 d., or 48 d., Ans.

114.  $\$9080 \times .03\frac{1}{2} = \$317.80$ ;  $\$794.50 \div \$317.80 = 2\frac{1}{2}$ .

$2\frac{1}{2}$  y. = 2 y. 6 mo., Ans.

115.  $\$750 \times .06 = \$45$ ;  $\$750 \div \$45 = 16\frac{2}{3}$ .

$16\frac{2}{3}$  y. = 16 y. 8 mo., Ans.

116.  $\$540 \times .04 = \$21.60$ ;  $\$700 - \$540 = \$160$ , interest.  
 $\$160 \div \$21.60 = 7\frac{1}{3}$ ;  $7\frac{1}{3}$  y. = 7 y. 4 mo.  $26\frac{2}{3}$  d., Ans.

117.  $\$892 \times .10 = \$89.20$ ;  $\$187 \div \$89.20 = 2\frac{43}{48}$ .  
 $2\frac{43}{48}$  y. = 2 y. 1 mo.  $41\frac{23}{24}$  d., Ans.

118.  $\$12000 \times .04\frac{1}{2} = \$540$ ;  $\$2500 \div \$540 = 4\frac{1}{2}$ .  
 $4\frac{1}{2}$  y. = 4 y. 7 mo.  $16\frac{2}{3}$  d., Ans.

119.  $\$6000 - \$4500 = \$1500$ ;  $\$4500 \times .03\frac{1}{2} = \$157.50$ .  
 $\$1500 \div \$157.50 = 9\frac{1}{3}$ ;  $9\frac{1}{3}$  y. = 9 y. 6 mo.  $8\frac{1}{3}$  d., Ans.

122.  $\$1 \times .06 \times 1\frac{7}{8} = \$0.08\frac{1}{2}$ ;  $\$6.25 \div \$0.08\frac{1}{2} = \$75$ , Ans.

### Article 268.

#### 123.

$\$1 \times .07 \times \frac{11}{60} = \$0.012\frac{1}{2}$ ;  $\$46.20 \div \$0.012\frac{1}{2} = \$3600$ , Ans.

124.  $\$1 \times .04 \times 1\frac{1}{2} = \$0.06$ ;  $\$1 + \$0.06 = \$1.06$ .  
 $\$318 \div \$1.06 = \$300$ , Ans.

125.  $\$1 \times .05 \times \frac{4}{9} = \$0.02\frac{2}{9}$ ;  $\$1 + \$0.02\frac{2}{9} = \$1.02\frac{2}{9}$ .  
 $\$734.20 \div \$1.02\frac{2}{9} = \$718.23\frac{2}{3}$ , Ans.

126.  $\$1 \times .06 = \$0.06$ ;  $\$210 \times 4 = \$840$ , annual income.  
 $\$840 \div \$0.06 = \$14000$ , Ans.

127.  $\$1 \times .05 = \$0.05$ ;  $\$1200 \div \$0.05 = \$24000$ , Ans.

#### 128.

$\$1 \times .07 \times 2\frac{1}{2} = \$0.175$ ;  $\$118.23 \div \$0.175 = \$675.60$ , Ans.



129.  $3\frac{1}{2}\% \times 2 = 6\frac{1}{2}\%$  annually;  $\$1 \times .06\frac{1}{2} = \$0.065$ .

$\$924 \div \$0.065 = \$14215.38\frac{4}{5}$ , Ans.

130.  $\$1 \times .04 = \$0.04$ ;  $\$560 \div \$0.04 = \$14000$ , Ans.

131.  $\$1 \times .09 = \$0.09$ ;  $\$324 \times 4 = \$1296$ , income.

$\$1296 \div \$0.09 = \$14400$ , Ans.

132.  $\$5400 \times 365 = \$1971000$ , annual income.

$\$1971000 \div 2 = \$985500$ .

$\$985500 \div .08 = \$12318750$ , invested in railroad stock.

$\$985500 \div .04 = \$24637500$ , " " gov't securities.

$\$12318750 + \$24637500 = \$36956250$ , Ans.

### Article 282.

#### 134.

Principal. . . . .	\$ 600.00
Int. from Jan. 6, 1880, to Apr. 6, 1880, 3 mo. . . . .	10.50
Amount . . . . .	<u>\$ 610.50</u>
1st payment . . . . .	50.00
New principal . . . . .	<u>\$ 560.50</u>
Int. from Apr. 6, 1880, to Nov. 21, 1880, 7 mo. 15 d. . . . .	24.52
Amount . . . . .	<u>\$ 585.02</u>
2d payment. . . . .	60.50
New principal . . . . .	<u>\$ 524.52</u>
Int. from Nov. 21, 1880, to Mar. 31, 1881, 4 mo. 10 d. . . . .	13.26
Amount . . . . .	<u>\$ 537.78</u>
3d payment . . . . .	150.00
New principal . . . . .	<u>\$ 387.78</u>
Int. from Mar. 31, 1881, to June 30, 1881, 3 mo. . . . .	6.79
Amount due June 30, 1881, . . . . . Ans.	<u>\$ 394.57</u>

## 135.

Principal . . . . .	\$ 750.00
Int. from Oct. 12, 1880, to Dec. 27, 1880, 2 mo. 15 d.	9.38
Amount . . . . .	<u>\$ 759.38</u>
1st payment . . . . .	325.00
New principal . . . . .	<u>\$ 434.38</u>
Int. from Dec. 27, 1880, to Aug. 7, 1881, 7 mo. 11 d.	16.00
Amount . . . . .	<u>\$ 450.38</u>
2d payment . . . . .	25.00
New principal . . . . .	<u>\$ 425.38</u>
Int. from Aug. 7, 1881, to July 1, 1882, 10 mo. 24 d.	22.97
Amount due July 1, 1882, . . . . . Ans.	<u>\$ 448.35</u>

## 136.

Principal . . . . .	\$ 1500.00
Int. from Mar. 10, 1880, to Nov. 25, 1880, 8 m. 15 d.	53.13
Int. from Nov. 25, 1880, to July 20, 1881, 7 m. 25 d.	48.96
Amount . . . . .	<u>\$ 1602.09</u>
1st payment less than interest due . . . . . \$ 45	
2d payment . . . . . 500	<u>\$ 545.00</u>
New principal . . . . .	<u>\$ 1057.09</u>
Int. from July 20, 1881, to Jan. 30, 1882, 6 m. 10 d.	27.90
Amount . . . . .	<u>\$ 1084.99</u>
3d payment . . . . .	600.00
New principal . . . . .	<u>\$ 484.99</u>
Int. from Jan. 30, 1882, to May 15, 1882, 3 m. 15 d.	7.07
Amount due May 15, 1882, . . . . . Ans.	<u>\$ 492.06</u>

## 137.

Principal . . . . .	\$ 563.50
Int. from May 16, 1881, to Sept. 26, 1881, 4 mo. 10 d.	14.24
Amount . . . . .	<u>\$ 577.74</u>
1st payment . . . . .	250.00
New principal . . . . .	<u>\$ 327.74</u>
Int. from Sept. 26, 1881, to May 16, 1882, 7 mo. 20 d.	14.66
Amount due May 16, 1882 . . . . . Ans.	<u>\$ 342.40</u>

## 138.

\$ 3000.

*Boston, Feb. 9, 1880.*

For value received I promise to pay CHARLES E. LOWE, or order, three thousand dollars, on demand, with interest at 5 per cent.

Indorsements: Mar. 9, 1881, \$ 1000; Nov. 24, 1881, \$ 800.

Principal . . . . .	\$ 3000.00
Int. from Feb. 9, 1880, to March 9, 1881, 1 y. 1 m.	162.50
Amount . . . . .	<u>\$ 3162.50</u>
1st payment . . . . .	1000.00
New principal . . . . .	<u>\$ 2162.50</u>
Int. from Mar. 9, 1881, to Nov. 24, 1881, 8 m. 15 d.	76.59
Amount . . . . .	<u>\$ 2239.09</u>
2d payment . . . . .	800.00
New principal . . . . .	<u>\$ 1439.09</u>
Int. from Nov. 24, 1881, to Jan. 3, 1882, 1 mo. 10 d.	7.99
Amount due Jan. 3, 1882 . . . . .	Ans. <u>\$ 1447.08</u>

## 139.

Principal . . . . .	\$ 1200.00
Int. from Aug. 7, 1880, to May 13, 1881, 9 m. 6 d. .	36.80
Amount . . . . .	<u>\$ 1236.80</u>
1st payment . . . . .	300.00
New principal . . . . .	<u>\$ 936.80</u>
Int. from May 13, 1881, to Nov. 23, 1882, 1y. 6m. 10d.	57.25
Amount . . . . .	<u>\$ 994.05</u>
2d payment . . . . .	275.00
New principal . . . . .	<u>\$ 719.05</u>
Int. from Nov. 23, 1882, to Jan 1, 1883, 1 m. 9 d. .	3.12
Amount due Jan. 1, 1883 . . . . .	Ans. <u>\$ 722.17</u>

**140.**

Principal . . . . .	\$ 6000.00
Int. from Jan. 1, 1879, to Aug. 11, 1879, 7 m. 10 d.	275.00
Amount . . . . .	<u>\$ 6275.00</u>
1st payment . . . . .	400.00
New principal . . . . .	<u>\$ 5875.00</u>
Int. from Aug. 11, 1879, to Dec. 15, 1880, 1y. 4m. 4d.	592.40
Amount . . . . .	<u>\$ 6467.40</u>
2d payment . . . . .	700.00
New principal . . . . .	<u>\$ 5767.40</u>
Int. from Dec. 15, 1880, to May 15, 1881, 5 m.	180.23
Amount due May 15, 1881 . . . . . Ans.	<u>\$ 5947.63</u>

**141.**

Principal . . . . .	\$ 500.00
Int. from Jan. 1, 1879, to Jan. 1, 1880, 1 y.	50.00
Amount . . . . .	<u>\$ 550.00</u>
1st payment . . . . .	100.00
New principal . . . . .	<u>\$ 450.00</u>
Int. from Jan. 1, 1880, to Jan. 1, 1881, 1 y.	45.00
Amount . . . . .	<u>\$ 495.00</u>
2d payment . . . . .	100.00
New principal . . . . .	<u>\$ 395.00</u>
Int. from Jan. 1, 1881, to June 19, 1881, 5 m. 18 d.	18.43
Amount due June 19, 1881 . . . . . Ans.	<u>\$ 413.43</u>

**142.**

Principal . . . . .	\$ 2400.00
Int. from Aug. 12, 1880, to Sept. 12, 1881, 1 y. 1 m.	117.00
“ “ Sept. 12, 1881, to Oct. 12, 1881, 1 m.	9.00
Amount . . . . .	<u>\$ 2526.00</u>
1st payment less than int. due . . . . . \$ 25	
2d payment . . . . . 700	<u>725.00</u>
New principal . . . . .	<u>\$ 1801.00</u>
Int. from Oct. 12, 1881, to Feb. 15, 1882, 4 m. 3 d.	27.69
Amount due Feb. 15, 1882 . . . . . Ans.	<u>\$ 1828.69</u>

**143.**

Principal . . . . .	\$ 1728.00
Int. from Nov. 23, 1878, to May 15, 1879, 5 m. 22 d.	74.30
Amount . . . . .	\$ 1802.30
1st payment . . . . .	248.00
New principal . . . . .	\$ 1554.30
Int. from May 15, 1879, to Aug. 28, 1880, 1y. 3m. 13d.	179.91
Amount . . . . .	\$ 1734.21
2d payment . . . . .	301.00
New principal . . . . .	\$ 1433.21
Int. from Aug. 28, 1880, to May 30, 1881, 9 m. 2 d.	97.46
Amount . . . . .	\$ 1530.67
3d payment . . . . .	300.00
New principal . . . . .	\$ 1230.67
Int. from May 30, 1881, to Nov. 10, 1881, 5 m. 11 d.	49.53
Amount due Nov. 10, 1881, . . . . . Ans.	\$ 1280.20

**Article 283.****145.**

Amount of \$ 1164.50 for 1 y. . . . .	\$ 1246.02
“ \$ 250.00 “ 9 mo. 15 d. . . . .	\$ 263.85
“ \$ 315.00 “ 7 mo. 14 d. . . . .	328.72
“ \$ 100.00 “ 4 mo. . . . .	102.33
“ \$ 200.00 “ 1 mo. 19 d. . . . .	201.91    896.81
	<hr/> Ans. \$ 349.21

**Article 285.**

151.	Principal for 1st year . . . . .	\$ 750.00
	Interest " " . . . . .	37.50
	Principal for 2d year . . . . .	<u>\$ 787.50</u>
	Interest " " . . . . .	39.38
	Principal for 3d year . . . . .	<u>\$ 826.88</u>
	Interest " " . . . . .	41.34
	Principal for 4th year . . . . .	<u>\$ 868.22</u>
	Interest " " . . . . .	43.41
	Compound amount for 4 years . . . . .	<u>\$ 911.63</u>
	Given principal . . . . .	750.00
	Compound interest for 4 years . . . . .	Ans. <u>\$ 161.63</u>

**Article 286.**

152.	Principal for 1st year . . . . .	\$ 600.00
	Interest " " . . . . .	30.00
	Principal for 2d year . . . . .	<u>\$ 630.00</u>
	Interest " " . . . . .	31.50
	Principal for 3d year . . . . .	<u>\$ 661.50</u>
	Interest " " . . . . .	33.08
	Principal for 6 mo. . . . .	<u>\$ 694.58</u>
	Interest " " . . . . .	17.36
	Compound amount for 3 y. 6 mo. . . . .	<u>\$ 711.94</u>
	Given principal . . . . .	600.00
	Compound interest for 3 y. 6 mo. . . . .	Ans. <u>\$ 111.94</u>
153.	Principal for 1st year . . . . .	\$ 320.00
	Interest " " . . . . .	22.40
	Principal for 2d year . . . . .	<u>\$ 342.40</u>
	Interest " " . . . . .	23.97
	Principal for 9 mo. . . . .	<u>\$ 366.37</u>
	Interest " " . . . . .	19.23
	Compound amount for 2 y. 9 mo. . . . .	<u>\$ 385.60</u>
	Given principal . . . . .	320.00
	Compound interest for 2 y. 9 mo. . . . .	Ans. <u>\$ 65.60</u>

**154.**

Principal for 1st year . . . . .	\$ 500.00
Interest    "    " . . . . .	<u>20.00</u>
Principal for 2d year . . . . .	\$ 520.00
Interest    "    " . . . . .	<u>20.80</u>
Principal for 3d year . . . . .	\$ 540.80
Interest    "    " . . . . .	<u>21.63</u>
Principal for 4th year . . . . .	\$ 562.43
Interest    "    " . . . . .	<u>22.50</u>
Principal for 4 mo. 15 d. . . . .	\$ 584.93
Interest    "    " . . . . .	<u>8.77</u>
Compound amount for 4 y. 4 mo. 15 d. .	\$ 593.70
Given principal . . . . .	<u>500.00</u>
Compound interest for 4 y. 4 mo. 15 d. Ans.	\$ 93.70

**155.**

Principal for 1st 6 mo. . . . .	\$ 1000.00
Interest    "    " . . . . .	<u>30.00</u>
Principal for 2d 6 mo. . . . .	\$ 1030.00
Interest    "    " . . . . .	<u>30.90</u>
Principal for 3d 6 mo. . . . .	\$ 1060.90
Interest    "    " . . . . .	<u>31.83</u>
Principal for 4th 6 mo. . . . .	\$ 1092.73
Interest    "    " . . . . .	<u>32.78</u>
Compound amount for 2 years . . . Ans.	\$ 1125.51

<b>156.</b>	Principal for 1st 3 mo.	. . . . .	\$ 1200.00
	Interest " "	. . . . .	12.00
	Principal for 2d 3 mo.	. . . . .	\$ 1212.00
	Interest " "	. . . . .	12.12
	Principal for 3d 3 mo.	. . . . .	\$ 1224.12
	Interest " "	. . . . .	12.24
	Principal for 4th 3 mo.	. . . . .	\$ 1236.36
	Interest " "	. . . . .	12.36
	Principal for 5th 3 mo.	. . . . .	\$ 1248.72
	Interest " "	. . . . .	12.49
	Principal for 6th 3 mo.	. . . . .	\$ 1261.21
	Interest " "	. . . . .	12.61
	Compound amount for 1 y. 6 mo.	. . . . .	Ans. \$ 1273.82

<b>157.</b>	Principal for 1st 6 mo.	. . . . .	\$ 200.00
	Interest " "	. . . . .	4.00
	Principal for 2d 6 mo.	. . . . .	\$ 204.00
	Interest " "	. . . . .	4.08
	Principal for 3d 6 mo.	. . . . .	\$ 208.08
	Interest " "	. . . . .	4.16
	Compound amount for 1 y. 6 mo.	. . . . .	Ans. \$ 212.24

<b>158.</b>	Simple int. of \$2000 for 1 y. 8 mo. 24 d.=	\$ 208.00
	Principal . . . . .	2000.00
	Amount of \$ 2000 for 1 y. 8 mo. 24 d.	\$ 2208.00
	Principal for 1 year . . . . .	\$ 2000.00
	Interest " " . . . . .	140.00
	Principal for 8 mo. 24 d. . . . .	\$ 2140.00
	Interest " " . . . . .	109.85
	Compound amount for 1 y. 8 mo. 24 d.	\$ 2249.85

$$\$ 2249.85 - \$ 2208 = \$ 41.85, \text{ gain, Ans.}$$



159. Principal for 1st 6 mo. . . . .	\$ 300.00
Interest " " . . . . .	12.00
Principal for 2d 6 mo. . . . .	<u>\$ 312.00</u>
Interest " " . . . . .	12.48
Principal for 3d 6 mo. . . . .	<u>\$ 324.48</u>
Interest " " . . . . .	12.98
Principal for 4th 6 mo. . . . .	<u>\$ 337.46</u>
Interest " " . . . . .	13.50
Principal for 5th 6 mo. . . . .	<u>\$ 350.96</u>
Interest " " . . . . .	14.04
Principal for 6th 6 mo. . . . .	<u>\$ 365.00</u>
Interest " " . . . . .	14.60
Principal for 7th 6 mo. . . . .	<u>\$ 379.60</u>
Interest " " . . . . .	15.18
Principal for 8th 6 mo. . . . .	<u>\$ 394.78</u>
Interest " " . . . . .	15.79
Principal for 9th 6 mo. . . . .	<u>\$ 410.57</u>
Interest " " . . . . .	16.42
Principal for 2 mo. 12 d. . . . .	<u>\$ 426.99</u>
Interest " " . . . . .	6.83
Compound amount for 4 y. 8 mo. 12 d. .	<u>\$ 433.82</u>
Given principal . . . . .	300.00
Compound int. for 4 y. 8 mo. 12 d. . Ans.	<u>\$ 133.82</u>

**Article 287.**

161. Amount of \$ 1 for 20 y. at 7%, from Table = \$ 3.869684.  
 Amount of \$ 500 for 20 y. at 7% = \$ 3.869684  $\times$  500 =  
 \$ 1934.84, Ans.

162. Amount of \$ 1 for 14 y. at 8%, from table = \$ 2.937194.  
 Amount of \$ 120 for 14 y. at 8% = \$ 2.937194  $\times$  120 = \$ 352.46  
 Given principal . . . . . 120.00  
 Compound interest of \$ 120 for 14 y. at 8% . Ans. \$ 232.46

**Article 291**

7.  $\$1 \times .07 \times 4 = \$0.28$ ;  $\$1 + \$0.28 = \$1.28$ .  
 $\$192 \div \$1.28 = \$150$ ;  $\$192 - \$150 = \$42$ , Ans.

**Article 292**

8.  $\$1 \times .07 \times 1\frac{1}{2} = \$0.105$ ;  $\$1 + \$0.105 = \$1.105$ .  
 $\$3450 \div \$1.105 = \$3122.17$ , Ans.
9.  $\$1 \times .06 \times 3\frac{1}{2} = \$0.20$ ;  $\$1 + \$0.20 = \$1.20$ .  
 $\$172.86 \div \$1.20 = \$144.05$ ;  $\$172.86 - \$144.05 =$   
 $\$28.81$ , Ans.
10.  $\$1 \times .04 \times \frac{1}{4} = \$0.01$ ;  $\$1 + \$0.01 = \$1.01$ .  
 $\$360 \div \$1.01 = \$356.44$ , Ans.
11.  $\$1 \times .07 \times 2\frac{1}{2} = \$0.175$ ;  $\$5000 \times .175 = \$875$ , int.  
 $\$1 + \$0.175 = \$1.175$ ;  $\$5000 \div \$1.175 = \$4255.32$ .  
 $\$5000 - \$4255.32 = \$744.68$ , discount.  
 $\$875 - \$744.68 = \$130.32$ , Ans.
12.  $\$1 \times .06 \times 2\frac{1}{2} = \$0.1575$ ;  $\$1 + \$0.1575 = \$1.1575$ .  
 $\$347.25 \div \$1.1575 = \$300$ , Ans.

**Article 294.**

13.  $\$125 \times .05 = \$6.25$ , Ans.
14.  $\$350 \times .06 = \$21$ ;  $\$350 - \$21 = \$329$ , Ans.
15.  $\$1344.50 \times .02 = \$26.89$ , Ans.
16.  $\$460.50 \times .10 = \$46.05$ ;  $\$460.50 - \$46.05 = \$414.45$ .  
 $\$414.45 \times .05 = \$20.72$ ;  $\$414.45 - \$20.72 =$   
 $\$393.73$ , Ans.

17.  $100\% - 6\% = 94\%$ ;  $\$483 = 94\%$ .

$$\frac{\$433}{94} \times 100 = \$460.64, \text{ Ans.}$$

18.  $\$1600 \times .25 = \$400$ ;  $\$1600 - \$400 = \$1200$ .

$$\$1200 \times .05 = \$60$$
;  $\$1200 - \$60 = \$1140$ .

$$\$1600 \times .70 = \$1120$$
;  $\$1140 - \$1120 = \$20$ , Ans.

19.

*Boston, Oct. 19, 1881.*

TAYLOR &amp; AMES,

Bought of LEE &amp; SHEPARD.

200 Harper's Geography @ 95¢, 10% off .....	\$ 171	00
50 Harrington's Graded Speller @ 18½¢, 7½% off .....	8	56
3 Cases School Slates @ \$6.35, 20% off .....	15	24
25 Webster's School Dictionary @ \$1.12, 12½% off .....	24	50
	<u>\$ 219</u>	<u>30</u>

$$\$219.30 \times .02\frac{1}{2} = \$5.48$$
;  $\$219.30 - \$5.48 = \$213.82$ , Ans.

20.

62 yd. Brussels carpeting @ \$1.87½ .....	\$ 116	25
118½ " 3-ply carpet @ 90¢ .....	106	65
1 set parlor furniture .....	285	
1 " black walnut chamber furniture.....	125	
1 " " " " " .....	140	
	<u>\$ 772</u>	<u>90</u>

$$\$772.90 \times .05 = \$38.65$$
;  $\$772.90 - \$38.65 = \$734.25$ , Ans.

**Article 300.**

23. Term of discount, 123 days ... Face of note, \$875.00

Interest for 60 " ..... \$8.75

" " 60 " ..... 8.75

" " 3 " ..... .437

Bank discount, \$17.94

Proceeds, \$857.06 } Ans.

## 24.

Term of discount, 183 days.....	Face of note, \$ 85.60	
Interest for       60 " .....		.856
"       "       120 " .....		1.712
"       "       3 " .....		.042
"       at 6 % .....		\$ 2.610
"       "   1 % .....		.435
"       "   7 % .....	Bank discount,	\$ 3.05
	Proceeds,	\$ 82.55 } Ans.

25. 93 d. after Jan. 4, 1881, = Apr. 7, 1881, day of maturity.  
 From Feb. 3, 1881, to Apr. 7, 1881, = 63 d., term of discount.  
 Interest of \$ 600 for 63 d. at 6 % = \$ 6.30, bank discount.

$$\text{\$ 600} - \text{\$ 6.30} = \text{\$ 593.70, proceeds, Ans.}$$

26. 4 mo. 3 d. = 123 d., day of maturity.  
 123 d. — 15 d. = 108 d., term of discount.  
 Interest of \$ 5000 for 108 d. at 8 % = \$ 120, bank discount.

$$\text{\$ 5000} - \text{\$ 120} = \text{\$ 4880, proceeds, Ans.}$$

27. Interest of \$ 10500 for 6 mo. 3 d. at 6 % = \$ 320.25.  
 $\text{\$ 10500} + \text{\$ 320.25} = \text{\$ 10820.25}$ , amount due at maturity.  
 6 mo. 3 d. = 183 d., time of maturity.  
 183 d. — 60 d. = 123 d., term of discount.  
 Int. of \$ 10820.25 for 123 d. at 5 % = \$ 184.85, bank discount.

$$\text{\$ 10820.25} - \text{\$ 184.85} = \text{\$ 10635.40, proceeds, Ans.}$$

28. 4 mo. 3 d. after Jan. 14 = May 17, day of maturity.  
 From Feb. 27 to May 17 = 79 d., term of discount.  
 Interest of \$ 485.96 for 79 d. at 6 % = \$ 6.40, bank discount.

$$\text{\$ 485.96} - \text{\$ 6.40} = \text{\$ 479.56, proceeds, Ans.}$$

29. 3 mo. 3 d. after Feb. 12 = May 15, day of maturity.  
From Mar. 8 to May 15 = 68 d., term of discount.  
Interest of \$ 966 for 68 d. at 7% = \$ 12.77, bank discount.  
 $\$ 966 - \$ 12.77 = \$ 953.23$ , proceeds, Ans.
30. 2 mo. 3 d. after Apr. 1 = June 4, day of maturity.  
From Apr. 15 to June 4 = 50 d., term of discount.  
Interest of \$ 1024 for 50 d. at  $7\frac{1}{2}\%$  = \$ 10.67, bank discount.  
 $\$ 1024 - \$ 10.67 = \$ 1013.33$ , proceeds, Ans.
31. 63 d. after May 5 = July 7, day of maturity.  
From May 27 to July 7 = 41 d., term of discount.  
Interest of \$ 287 for 41 d. at 8% = \$ 2.61, bank discount.  
 $\$ 287 - \$ 2.61 = \$ 284.39$ , proceeds, Ans.
32. 93 d. after July 10 = Oct. 11, day of maturity.  
93 d. = term of discount.  
Interest of \$ 648.50 for 93 d. at 5% = \$ 8.38, bank discount.  
 $\$ 648.50 - \$ 8.38 = \$ 640.12$ , proceeds, Ans.
33. 5 mo. 3 d. after June 15 = Nov. 18, day of maturity.  
From Aug. 4 to Nov. 18 = 106 d., term of discount.  
Interest of \$ 984 for 106 d. at 9% = \$ 26.07, bank discount.  
 $\$ 984 - \$ 26.07 = \$ 957.93$ , proceeds, Ans.
34. 6 mo. 3 d. after Sept. 20 = Mar. 23, day of maturity.  
From Nov. 27 to Mar. 23 = 116 d., term of discount.  
Interest of \$ 328 for 116 d. at 4% = \$ 4.23, bank discount.  
 $\$ 328 - \$ 4.23 = \$ 323.77$ , proceeds, Ans.
35. 33 d. after Aug. 25 = Sept. 27, day of maturity.  
From Sept. 1 to Sept. 27 = 26 d., term of discount.  
Int. of \$ 696 for 26 d. at  $4\frac{1}{2}\%$  = \$ 2.26, bank discount.  
 $\$ 696 - \$ 2.26 = \$ 693.74$ , proceeds, Ans.

36. 1 mo. 3 d. after Oct. 31 = Dec. 3, day of maturity.  
From Nov. 1 to Dec. 3 = 32 d., term of discount.  
Int. of \$842.50 for 32 d. at  $3\frac{1}{2}\%$  = \$2.62, bank discount.  
 $\$842.50 - \$2.62 = \$839.88$ , proceeds, Ans.
37. 3 mo. 3 d. after Sept. 7 = Dec. 10, day of maturity.  
From Oct. 10 to Dec. 10 = 61 d., term of discount.  
Int. of \$500 for 61 d. at  $6\%$  = \$5.08, bank discount.  
 $\$500 - \$5.08 = \$494.92$ , proceeds, Ans.
38. 78 d. after Nov. 12 = Jan. 29, day of maturity.  
From Dec. 15 to Jan. 29 = 45 d., term of discount.  
Int. of \$8643 for 45 d. at  $7\%$  = \$75.63, bank discount.  
 $\$8643 - \$75.63 = \$8567.37$ , proceeds, Ans.
39. 4 mo. 3 d. after Jan. 17 = May 20, day of maturity.  
From Feb. 10 to May 20 = 99 d., term of discount.  
Int. of \$242.16 for 99 d. at  $10\%$  = \$6.66, bank discount.  
 $\$242.16 - \$6.66 = \$235.50$ , proceeds, Ans.
40. 93 d. after Dec. 27 = Mar. 30, day of maturity.  
From Jan. 15 to Mar. 30 = 74 d., term of discount.  
Int. of \$800 for 74 d. at  $3\%$  = \$4.93, bank discount.  
 $\$800 - \$4.93 = \$795.07$ , proceeds, Ans.
41. 3 mo. 3 d. after Mar. 5 = June 8, day of maturity.  
From May 1 to June 8 = 38 d., term of discount.  
Int. of \$560 for 38 d. at  $8\%$  = \$4.73, bank discount.  
 $\$560 - \$4.73 = \$555.27$ , proceeds, Ans.
42. 6 mo. 3 d. after Dec. 11 = June 14, day of maturity.  
From March 18 to June 14 = 88 d., term of discount.  
Int. of \$576 for 88 d. at  $5\%$  = \$7.04, bank discount.  
 $\$576 - \$7.04 = \$568.96$ , proceeds, Ans.

43. 4 mo. 3 d. after Aug. 8 = Dec. 11, day of maturity.  
From Oct. 27 to Dec. 11 = 45 d., term of discount.  
Int. of \$ 898.96 for 45 d. at 9% = \$ 10.11, bank discount.  
 $\$ 898.96 - \$ 10.11 = \$ 888.85$ , proceeds, Ans.
45. Bank discount of a \$ 1 note for 63 days = \$ 0.01225.  
Proceeds of a \$ 1 note = \$ 1 - \$ 0.01225 = \$ 0.98775.  
 $\$ 1500 \div \$ 0.98775 = \$ 1518.60+$ , Ans.
46. Bank discount of a \$ 1 note for 4 mo. 3 d. = \$ 0.0205.  
Proceeds of a \$ 1 note = \$ 1 - \$ 0.0205 = \$ 0.9795.  
 $\$ 293.85 \div \$ 0.9795 = \$ 300$ , face of note, Ans.

### Article 301.

47. Bank discount of a \$ 1 note for 63 d. = \$ 0.01225.  
Proceeds of a \$ 1 note = \$ 1 - \$ 0.01225 = \$ 0.98775.  
 $\$ 444.48\frac{1}{2} \div \$ 0.98775 = \$ 450$ , face of note, Ans.
48. Bank discount of a \$ 1 note for 6 mo. at 10% = \$ 0.05.  
Proceeds of a \$ 1 note = \$ 1 - \$ 0.05 = \$ 0.95.  
 $\$ 1520 \div \$ 0.95 = \$ 1600$ , face of note, Ans.
49. Bank discount of a \$ 1 note for 93 d. = \$ 0.0155.  
Proceeds of a \$ 1 note = \$ 1 - \$ 0.0155 = \$ 0.9845.  
 $\$ 828.95 \div \$ 0.9845 = \$ 842.00+$ , face of note, Ans.
50. Bank discount of a \$ 1 note for 8 m. 3 d. at  $7\frac{1}{2}\%$  = \$ 0.050625.  
Proceeds of a \$ 1 note = \$ 1 - \$ 0.050625 = \$ 0.949375.  
 $\$ 483.56 \div \$ 0.949375 = \$ 509.34$ , face of note, Ans.

## MISCELLANEOUS EXERCISES.

51. From Oct. 6, 1881, to Apr. 18, 1882, = 6 mo. 12 d. =  $\frac{1}{12}$  y.  
 $\$1 \times .05 \times \frac{1}{12} = \$0.026\frac{2}{3}$ ;  $\$1 + \$0.026\frac{2}{3} = \$1.026\frac{2}{3}$ .  
 $\$924 \div \$1.026\frac{2}{3} = \$900$ , present worth.

$$\$924 - \$900 = \$24, \text{ discount, Ans.}$$

52.  $\$1 \times .08 = \$0.08$ ;  $\$1 + \$0.08 = \$1.08$ .  
 $\$540 \div \$1.08 = \$500$ , present worth.

$$\$500 \times .08 = \$40, \text{ interest, Ans.}$$

53.  $\$1380 - \$1200 = \$180$ , interest.  
 $\$1200 \times .06 = \$72$ ;  $\$180 \div \$72 = 2\frac{1}{2} = 2 \text{ y. } 6 \text{ mo.}$   
 Oct. 15, 1880 — 2 y. 6 mo. = Apr. 15, 1878, Ans.

54.  $1\frac{1}{2}\%$  a month =  $1\frac{1}{2}\% \div 30 = \frac{1}{20}\%$  a day.  
 $\$1 \times \frac{1}{20} \times 63 = \$0.0315$ , bank discount of \$1 for 63 d.  
 $\$1 - \$0.0315 = \$0.9685$ , proceeds of \$1.  
 $\$5811 \div \$0.9685 = \$6000$ , face of note, Ans.

55. 4 mo. 3 d. after Aug. 22 = Dec. 25.

Since the note becomes due on a legal holiday, it must be paid one day earlier, or Dec. 24, Ans.

56.  $\$1 \times .06 \times 4 = \$0.24$ ;  $\$1 + \$0.24 = \$1.24$ .  
 $\$477.71 \div \$1.24 = \$385.25$ , present worth, Ans.

57.  $\$1 \times .07 \times \frac{72}{360} = \$0.014$ ;  $\$1 + \$0.014 = \$1.014$ .  
 $\$900 \div \$1.014 = \$887.57$ , present worth.  
 $\$900 - \$887.57 = \$12.43$ , discount, Ans.



58.  $\$1 \times .06 \times 1\frac{1}{2} = \$0.08$ ;  $\$1 + \$0.08 = \$1.08$ .  
 $\$576 \div \$1.08 = \$533.33$ , present worth.  
 $\$576 - \$533.33 = \$42.67$ , discount.  
 $\$576 \times .06 \times 1\frac{1}{2} = \$46.08$ , interest.  
 $\$46.08 - \$42.67 = \$3.41$ , Ans.

59. Term of discount, 93 days... Face of note,  $\$368$ .  

Interest for	<u>60</u>	"	.....	3.68
"	30	"	.....	1.84
"	3	"	.....	.184
			Bank discount,	<u><math>\\$5.70</math></u>
			Proceeds,	$\$362.30$

} Ans.

60. 63 days after Jan. 31, 1882, = Apr. 4, 1882, Ans.

61.  $\$1 \times .07 \times 3 = \$0.21$ ;  $\$1 + \$0.21 = \$1.21$ .  
 $\$4235 \div \$1.21 = \$3500$ , present worth.  
 $\$3675 - \$3500 = \$175$ , loss, Ans.

62. Bank discount of  $\$1$  for 33 d. at 6% =  $\$0.0055$ .  
Proceeds of  $\$1 = \$1 - \$0.0055 = \$0.9945$ .  
 $\$500 \div \$0.9945 = \$502.77$ , face of note, Ans.

63.  $\$750 \times .07\frac{1}{2} \times \frac{7}{4} = \$16.41$ , int. of  $\$750$  for 3 mo. 15 d.  
 $\$750 + \$16.41 = \$766.41$ , amount of  $\$750$ .  
Bank discount of  $\$1$  for 48 d. at 7% =  $\$0.009\frac{1}{2}$ .  
Proceeds of  $\$1 = \$1 - \$0.009\frac{1}{2} = \$0.990\frac{1}{2}$ .  
 $\$766.41 \div \$0.990\frac{1}{2} = \$773.63$ , face of note, Ans.

64. 1 A. = 43560 sq. ft.;  $43560 \times .05 = \$2178$ , sold for.  
Bank discount of  $\$1$  for 6 mo. 3 d. at 5% =  $\$0.0254\frac{1}{2}$ .  
Bank discount of  $\$2178 = 2178 \times \$0.0254\frac{1}{2} = \$55.36$ .  
Proceeds of  $\$2178 = \$2178 - \$55.36 = \$2122.64$ .  
 $\$2122.64 - \$400 = \$1722.64$ , profit, Ans.

**Article 314.**

8.  $102\frac{1}{2}\% + \frac{1}{4}\% = 102\frac{3}{4}\%$ ;  $102\frac{3}{4}\%$  of \$2000 = \$2050, Ans.

9.  $113\frac{1}{2}\% + \frac{1}{8}\% = 113\frac{5}{8}\%$ ;  
 $113\frac{5}{8}\%$  of \$30000 = \$34087.50, Ans.

10.  $101\frac{1}{2}\%$  of \$1250 = \$1268.75, Ans.

12.  $\$100 \times 25 = \$2500$ , par value.  
 $\frac{1}{8}\%$  of \$2500 = \$3.125, brokerage.  
 $\$3206.25 - \$3.125 = \$3203.12\frac{1}{2}$ .  
 $\$3203.12\frac{1}{2} \div 25 = \$128.12\frac{1}{2}$ , Ans.

13. \$1 in gold = \$1.01 $\frac{3}{4}$  in currency.  
 $\$126.75 \div 1.01\frac{3}{4} = \$124.57\frac{1}{4}\frac{1}{7}$ , Ans.

14.  $\$100 \times 10 = \$1000$ , par value.  
 $\frac{1}{4}\%$  of \$1000 = \$2.50, the brokerage.  
 $\$1302.50 - \$2.50 = \$1300$ , the market value.  
 $\$1300 \div 10 = \$130$ , market value of 1 share, Ans.

16.  $105\frac{3}{4}\% + \frac{1}{4}\% = 106\%$ .  
 $\$2650 \div 1.06 = \$2500$ , par value.  
 $\$2500 \times .05 = \$125$ , yearly income, Ans.

17.  $86\% + \frac{1}{4}\% = 86\frac{1}{4}\%$ .  
 $\$6900 \div .86\frac{1}{4} = \$8000$ , par value.  
 $\$8000 \times .04\frac{1}{2} = \$360$ , yearly income, Ans.

18.  $105\frac{3}{4}\% + \frac{1}{4}\% = 106\%$ ;  $\$2650 \div 1.06 = \$2500$ , par value  
 $\$2500 \times .06 = \$150$ , yearly income.

$104\frac{1}{4}\% + \frac{1}{4}\% = 104\frac{1}{2}\%$ ;  $\$3135 \div 1.04\frac{1}{2} = \$3000$ , par value  
 $\$3000 \times .05 = \$150$ , yearly income.

Ans. Each yields the same income.

20.  $\$900 \div .04\frac{1}{2} = \$20000$ , par value of stock.  
 $\$20000 \times 1.05\frac{1}{2} = \$21100$ , amount to be invested, Ans.
21.  $\$1050 \div .07 = \$15000$ , par value of stock.  
 $\$15000 \times 1.09 = \$16350$ , amount to be invested, Ans.
22.  $\$2500 \div .05 = \$50000$ , par value of stock.  
 $\$50000 \times 1.09 = \$54500$ , amount to be invested, Ans.
24. The annual income of a share of 5% stock is \$5.  
 If the cost is \$110, the income is  $\frac{5}{110}$ , or  $\frac{1}{22}$ , or  $4\frac{4}{11}\%$  of the cost, Ans.
25. The annual income of a share of 6% stock is \$6.  
 If the cost is \$120, the income is  $\frac{6}{120}$ , or  $\frac{1}{20}$ , or 5% of the cost.  
 The annual income of a share of 5% stock is \$5.  
 If the cost is \$105, the income is  $\frac{5}{105}$ , or  $\frac{1}{21}$ , or  $4\frac{4}{21}\%$  of the cost.  
 $5\% - 4\frac{4}{21}\% = \frac{5}{21}\%$ .  
 Ans. Railroad 6's  $\frac{5}{21}\%$  greater.
26. The annual income of a share of 8% stock is \$8.  
 If the cost is \$125, the income is  $\frac{8}{125}$ , or  $6\frac{2}{5}\%$  of the cost, Ans.
28. A 6% stock yields \$6 on an investment of \$100.  
 If the \$6 is 7% of the investment,  $1\% = \frac{1}{7}$  of \$6.  
 $100\%$  of the investment =  $100 \times \frac{1}{7}$  of \$6, or \$85 $\frac{4}{7}$ , Ans.
29. A 8% stock yields \$8 on an investment of \$100.  
 If the \$8 is 6% of the investment,  $1\% = \frac{1}{6}$  of \$8.  
 $100\%$  of the investment =  $100 \times \frac{1}{6}$  of \$8, or \$133 $\frac{1}{3}$ , Ans.

**Article 323.**

5.  $\$1164 \times .01 = \$11.64$ , premium.  
 $\$1164 + \$11.64 = \$1175.64$ , cost of the draft, Ans.

6.  $\$4000 \times .025 = \$100$ , discount.  
 $\$4000 - \$100 = \$3900$ , cost of the draft, Ans.
7.  $\$2517.70 \times .00\frac{1}{2} = \$3.14\frac{1}{2}$ , premium.  
 $\$2517.70 + \$3.14\frac{1}{2} = \$2520.84\frac{1}{2}$ , cost of the draft, Ans.
9.  $\$1 + \$0.00125 = \$1.00125$ , cost of \$1 of the draft.  
 $\$2520.84 \div \$1.00125 = \$2517.69+$ , face of the draft, Ans.
10.  $\$1 - \$0.025 = \$0.975$ , cost of \$1 of the draft.  
 $\$3900 \div \$0.975 = \$4000$ , face of the draft, Ans.
11.  $\$1 + \$0.01 = \$1.01$ , cost of \$1 of the draft.  
 $\$1175.64 \div \$1.01 = \$1164$ , face of the draft, Ans.
12.  $\$1 - \$0.00625 = \$0.99375$ , cost of \$1 of the draft.  
 $\$447.18\frac{1}{2} \div \$0.99375 = \$450$ , face of the draft, Ans.
14.  $\$1 \times .995 = \$0.995$ , cost of \$1 at sight at  $\frac{1}{2}\%$  discount.  
 $\$0.995 \times 1500 = \$1492.50$ , cost of \$1500 " "  
 $\$1500 \times 0.01225 = \$18.375$ , discount.  
 $\$1492.50 - \$18.375 = \$1474.12\frac{1}{2}$ , cost of the draft, Ans.
15.  $\$1 \times 1.01 = \$1.01$ , cost of \$1 at sight at 1% premium.  
 $\$1.01 \times 3000 = \$3030$ , cost of \$3000.  
 $\$3000 \times 0.0105 = \$31.50$ , discount.  
 $\$3030 - \$31.50 = \$2998.50$ , cost of the draft, Ans.
17.  $\$1 \times 0.0055 = \$0.0055$ , int. of \$1 for 33 days.  
 $\$1 - \$0.0055 = \$0.9945$ , cost of \$1 of exchange.  
 $\$3978 \div \$0.9945 = \$4000$ , face of the draft, Ans.

18.  $\$1 - \$0.005 = \$0.995$ , cost of  $\$1$  at sight.  
 $\$1 \times 0.01225 = \$0.01225$ , int. of  $\$1$  for 63 days.  
 $\$0.995 - \$0.01225 = \$0.98275$ , cost of  $\$1$  of exchange.  
 $\$491.37\frac{1}{2} \div 0.98275 = \$500$ , face of the draft, Ans.
19.  $\$1 + \$0.01 = \$1.01$ , cost of  $\$1$  at sight.  
 $\$1 \times 0.0055 = \$0.0055$ , int. of  $\$1$  for 33 days.  
 $\$1.01 - \$0.0055 = \$1.0045$ , cost of  $\$1$  of exchange.  
 $\$2998.50 \div 1.0045 = \$2985.067+$ , face of the draft, Ans.

### Article 330.

21.  $\$777.94 \div 4.85 = \pounds 160.4 = \pounds 160 \text{ 8s.}$ , Ans.
22.  $\pounds 1320 \text{ 10s.} = \pounds 1320.5$ .  
 $\$4.87\frac{1}{2} \times 1320.5 = \$6437.43\frac{3}{4}$ , Ans.
23.  $\$1 = 5.15 \text{ francs}$ ;  $2380 \div 5.15 = \$462.13\frac{61}{103}$ , Ans.
24.  $\$1 = 5.19 \text{ francs}$ ;  $1500 \div 5.19 = \$289.01\frac{1}{4}\frac{2}{3}$ , Ans.
25.  $\$1 = 5.20 \text{ francs}$ ;  $3195 \times 5.20 \text{ f.} = 16614 \text{ f.}$ , Ans.
26.  $\frac{1304}{4} \times \$0.95 = \$309.70$ , Ans.
27. Exchange =  $\$0.95\frac{1}{2}$  per 4 reichsmarks.  
 $\$0.95\frac{1}{2} \div 4 = \$0.23\frac{7}{8}$  per 1 reichsmerk.  
 $\$1420.20 \div \$0.23\frac{7}{8} = 5948\frac{2}{9}\frac{2}{1}$  reichsmarks, Ans.
28.  $\pounds 1254 \text{ 15s. 6d.} = \pounds 1254.775$ ;  
 $1254.775 \times \$4.87\frac{1}{2} = \$6117.03$ , Ans.
29.  $1042.50 \times 5.21\frac{1}{2} \text{ francs} = 5434.03\frac{1}{2} \text{ francs}$ , Ans.

**Article 334.**

7. Jan. 3 + 30 days = Feb. 2, \$ 150 is due.

Jan. 15 + 3 mo. = Apr. 15, or 72 d. after Feb. 2, \$125 is due.

Feb. 1 + 60 d. = Apr. 2, or 59 d. after Feb. 2, \$200 is due.

$$\begin{array}{r}
 150 \\
 125 \times 72 \text{ days} = 9000 \text{ days:} \\
 200 \times 59 \text{ " } = 11800 \text{ " } \\
 \hline
 475 \qquad \qquad \qquad ) 20800 \text{ " } \\
 \hline
 44 \text{ days.}
 \end{array}$$

Feb. 2 + 44 d. = Mar. 18, average time, Ans.

- 8.
- $40 \times 3 \text{ mo.} = 120 \text{ mo.}$

$$\begin{array}{r}
 60 \times 5 \text{ " } = 300 \text{ " } \\
 \hline
 100 \qquad \qquad \qquad ) 420 \text{ " } \\
 \hline
 4\frac{1}{2} \text{ mo., or 4 mo. 6 d.}
 \end{array}$$

May 7 + 4 mo. 6 d. = Sept. 13, average time, Ans.

9. 250

$$350 \times 2 = 700 \text{ mo.}$$

$$400 \times 6 = 2400 \text{ "}$$

$$\begin{array}{r}
 1000 \qquad \qquad \qquad ) 3100 \text{ " } \\
 \hline
 3\frac{1}{10} \text{ mo., or 3 mo. 3 d., average time, Ans.}
 \end{array}$$

- 10.
- $170 \times 40 \text{ days} = 6800 \text{ days.}$

$$200 \times 60 \text{ " } = 12000 \text{ "}$$

$$150 \times 90 \text{ " } = 13500 \text{ "}$$

$$\begin{array}{r}
 520 \qquad \qquad \qquad ) 32300 \text{ " } \\
 \hline
 62 \text{ days.}
 \end{array}$$

May 16, 1881, + 62 days = July 17, 1881, equated time, Ans.

11. Apr. 15, \$ 200 is due.

May 1, or 16 days after Apr. 15, \$ 311 is due.

June 1, or 47 " " " \$ 160 "

$$\begin{array}{r}
 200 \\
 311 \times 16 = 4976 \text{ days.} \\
 160 \times 47 = 7520 \text{ " } \\
 \hline
 671 \quad ) 12496 \text{ " } \\
 \hline
 19 \text{ days.}
 \end{array}$$

Apr. 15 + 19 days = May 4, average time, Ans.

12.  $800 \times 30 \text{ days} = 24000 \text{ days.}$

$500 \times 60 \text{ " } = 30000 \text{ "}$

$120 \times 90 \text{ " } = 10800 \text{ "}$

$\hline 1420 \quad ) 64800 \text{ "}$

46 days, average time, Ans.

### Article 335.

13. July 5, \$ 600 is due.

July 15, or 10 days after July 5, \$ 400 is due.

Aug. 10, or 36 " " " \$ 500 "

$$\begin{array}{r}
 600 \\
 400 \times 10 \text{ days} = 4000 \text{ days.} \\
 500 \times 36 \text{ " } = 18000 \text{ " } \\
 \hline
 1500 \quad ) 22000 \text{ " } \\
 \hline
 15 \text{ days.}
 \end{array}$$

July 5, 1881, + 15 d. + 60 d. = Sept. 18, 1881, average time, Ans.

14. Sept. 9, \$ 140 is due.

Oct. 9, or 30 days after Sept. 9, \$ 160 is due.

Nov. 6, or 58 " " " \$ 200 "

140

$160 \times 30 \text{ days} = 4800 \text{ days.}$

$200 \times 58 \text{ " } = 11600 \text{ "}$

$\begin{array}{r} 500 \\ \hline \end{array} \quad \quad \quad ) \overline{16400} \text{ "}$

$\quad \quad \quad \underline{\quad \quad \quad} 33 \text{ days.}$

Sept. 9, 1880, + 33 d. + 4 m. = Feb. 12, 1881, average time, Ans.

15. Apr. 11, \$ 450 is due.

Apr. 30, or 19 days after Apr. 11, \$ 600 is due.

May 16, or 35 days after Apr. 11, \$ 400 is due.

450

$600 \times 19 \text{ days} = 11400 \text{ days.}$

$400 \times 35 \text{ " } = 14000 \text{ "}$

$\begin{array}{r} 1450 \\ \hline \end{array} \quad \quad \quad ) \overline{25400} \text{ "}$

$\quad \quad \quad \underline{\quad \quad \quad} 17\frac{1}{2} = 18 \text{ days.}$

Apr. 11, 1881, + 18 d. + 63 d. = July 1, 1881, average date, Ans.

16. July 2, \$ 225 is due.

Aug. 4, or 33 days after July 2, \$ 360 is due.

Sept. 10, or 70 " " " \$ 500 "

Sept. 24, or 84 " " " \$ 320 "

225

$360 \times 33 \text{ days} = 11880 \text{ days.}$

$500 \times 70 \text{ " } = 35000 \text{ "}$

$320 \times 84 \text{ " } = 26880 \text{ "}$

$\begin{array}{r} 1405 \\ \hline \end{array} \quad \quad \quad ) \overline{73760} \text{ "}$

$\quad \quad \quad \underline{\quad \quad \quad} 52 \text{ days.}$

July 2, 1881, + 52 d. + 6 mo. = Feb. 23, 1882, average time, Ans.



**Article 336.**

$$17. \frac{2\frac{1}{2}}{3\frac{3}{4}} = \frac{\cancel{5}}{\cancel{2}} \times \frac{\cancel{4}^2}{\cancel{15}_3} = \frac{2}{3} \text{ of } 100\% = 66\frac{2}{3}\%, \text{ Ans.}$$

$$18. \frac{\overset{337}{\cancel{2359}}}{\underset{\cancel{5}}{\cancel{35}}} \times \frac{20}{\cancel{100}} = \$6740, \text{ Ans.}$$

$$19. \frac{3}{4} \text{ of } \$1200 = \$900; 17\% \text{ of } \$900 = \$153, \text{ gain.}$$

$$\$900 + \$153 = \$1053, \text{ Ans.}$$

$$20. \$360 = 80\%; \frac{\overset{90}{\cancel{360}}}{\underset{\cancel{4}}{\cancel{80}}} \times \frac{5}{\cancel{100}} = \$450, \text{ value.}$$

$$\$450 \times 1.30 = \$585, \text{ Ans.}$$

$$21. 50 \times 10 = 500 \text{ words; } 500 - 75 = 425, \text{ spelled correctly.}$$

$$\frac{425}{500} = \frac{17}{20} \text{ of } 100\% = 85\%, \text{ Ans.}$$

$$22. \text{ The year } 1880 = 366 \text{ d.; June } 15 = 167 \text{ d. from Jan. 1.}$$

$$\frac{167}{366} \text{ of } 100\% = 45\frac{11}{13}\%, \text{ Ans.}$$

$$23. \$232.75 = 95\%; \frac{\$232.75}{95} \times 100 = \$245.00.$$

$$\$245.00 - \$232.75 = \$12.25, \text{ discount, Ans.}$$

## 24.

12 Webster's Unabridged Dict. @ \$9.50, 10% off, = \$102.60

15 Longfellow's Poems..... " \$1.50, 5% " = 21.37 $\frac{1}{2}$   
\$123.97 $\frac{1}{2}$

$$\$123.97\frac{1}{2} \times .03 = \$3.71\frac{3}{4}, \text{ discount.}$$

$$\$123.97\frac{1}{2} - \$3.71\frac{3}{4} = \$120.25\frac{1}{2}, \text{ cost, Ans.}$$

25. Time = 1 y. 5 mo. 28 d.

2) \$325 = Principal.

1.625 = 1 month's interest.

17 $\frac{1}{2}$  = Time in months.

11375

1625

1516 $\frac{3}{4}$

\$29.141 = Interest at 6%.

6.071 = " " 1 $\frac{1}{2}$ %.

\$35.212 = " " 7 $\frac{1}{2}$ %, Ans.

26. \$922 \times .05 = \$46.10; \$53.78 $\frac{1}{2} \div $46.10 =$

1 $\frac{1}{2}$  $\frac{1}{2}$  y., or 1 y. 2 mo., Ans.

27. Bank discount of a \$1 note for 63 d. at 6% = \$0.0105.

Proceeds of a \$1 note = \$1 - \$0.0105 = \$0.9895.

\$593.70 \div \$0.9895 = \$600, face of note, Ans.

28. \$774.40 - \$640 = \$134.40, interest.

\$640 \times .01 \times 3\frac{1}{2} = \$22.40.

\$134.40 \div \$22.40 = 6, Ans.

29.  $\frac{3}{4}$  of \$6000 = \$4000.

\$6000 \times .08 = \$480.

\$4000 \div \$480 = 8 $\frac{1}{3}$  y. = 8 y. 4 mo., Ans.

30. The present worth of \$1550 due in 30 days is  $\$1550 \div \$1.005 = \$1542.29$ .

$\$1550 - \$1542.29 = \$7.71$ , true discount.

5% of \$1550 = \$77.50, the discount offered for cash.

$\$77.50 - \$7.71 = \$69.79$ , difference, Ans.

31.  $\$6415.50 \times .05 \times 3\frac{1}{2} = \$1122.71\frac{1}{2}$ , simple interest.

$\$1 \times .05 \times 3\frac{1}{2} = \$0.17\frac{1}{2}$ ;  $\$1 + \$0.17\frac{1}{2} = \$1.17\frac{1}{2}$ .

$\$6415.50 \div \$1.17\frac{1}{2} = \$5460$ , present worth.

$\$6415.50 - \$5460 = \$955.50$ , discount.

$\$1122.71\frac{1}{2} - \$955.50 = \$167.21\frac{1}{2}$ , Ans.

32.  $\$1300 \times .07 \times 4 = \$364$ , simple interest.

Principal for 1st year . . . . .	\$1300.00
----------------------------------	-----------

Interest " " . . . . .	91.00
------------------------	-------

Principal for 2d year . . . . .	\$1391.00
---------------------------------	-----------

Interest " " . . . . .	97.37
------------------------	-------

Principal for 3d year . . . . .	\$1488.37
---------------------------------	-----------

Interest " " . . . . .	104.19
------------------------	--------

Principal for 4th year . . . . .	\$1592.56
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Interest " " . . . . .	111.48
------------------------	--------

Compound amount for 4 years . . . . .	\$1704.04
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Given principal . . . . .	1300.00
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Compound interest for four years . . . . .	\$404.04
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$\$404.04 - \$364 = \$40.04$ , Ans.

### 33.

Principal . . . . .	\$2000.00
---------------------	-----------

Int. from Jan. 1, 1880, to July 1, 1880, 6 m. . . . .	60.00
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Amount . . . . .	\$2060.00
------------------	-----------

1st payment . . . . .	500.00
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New principal . . . . .	\$1560.00
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Int. from July 1, 1880, to Jan. 1, 1882, 1y. 6m. . . . .	140.40
--	--------

Amount due Jan. 1, 1882 . . . . . Ans.	\$1700.40
--	-----------

34. The annual income of a share of 4% stock is \$4.

If the cost is \$92, the income is  $\frac{4}{92}$ , or  $\frac{1}{23}$ , or  $4\frac{2}{23}\%$  of the cost.

The annual income of a share of 5% stock is \$5.

If the cost is \$110, the income is  $\frac{5}{110}$ , or  $\frac{1}{22}$ , or  $4\frac{4}{11}\%$  of the cost.

$$4\frac{6}{11}\% - 4\frac{2}{23}\% = \frac{1}{55}.$$

$$\$82.50 = \frac{1}{506}; \quad \frac{506}{506} = 506 \times \$82.50 = \$41745, \text{ Ans.}$$

35.  $\$26250 \div .87\frac{1}{2} = \$30000$ , face of bonds.

$\$30000 \times .91 = \$27300$ , proceeds of sale.

$$\$27300 - \$26250 = \$1050, \text{ gain, Ans.}$$

36.  $\$9080 \div .85\frac{1}{4} = \$10666\frac{2}{3}$ , par value.

$\$10666\frac{2}{3} \times .03 = \$320$ , yearly income.

$\$9800 \div 1.22\frac{1}{2} = \$8000$ , par value.

$\$8000 \div .05 = \$400$ , yearly income.

$$\$400 - \$320 = \$80, \text{ Ans.}$$

37.  $100 \times 50 \text{ days} = 5000 \text{ days.}$

$$130 \times 40 \text{ " } = 5200 \text{ "}$$

$$230 \times 140 \text{ " } = 32200 \text{ "}$$

$$\frac{460}{460} \quad ) \frac{42400}{42400} \text{ "}$$

$$92\frac{4}{23} = 92 \text{ days, Ans.}$$

### 38.

$\$2660 \times .0105 = \$27.93$ , int. of \$2660 for 63 d. at 6%.

$\$2570.89 + \$27.93 = \$2598.82$ , cost of \$2660 at sight.

$\$2598.82 \div \$2660 = 97\frac{7}{10}\%$  of face of draft.

$$100\% - 97\frac{7}{10}\% = 2\frac{3}{10}\%, \text{ discount, Ans.}$$

## 39.

Principal . . . . .	\$ 500.00
Int. from Oct. 8, 1880, to Nov. 4, 1881, 1 y. 27 d. . .	32.25
Int. from Nov. 4, 1881, to Jan. 30, 1882, 2 m. 26 d. .	7.17
Amount . . . . .	<u>\$ 539.42</u>
1st payment, less than interest due . . . . .	\$ 30
2d " . . . . .	<u>250</u>
New principal . . . . .	\$ 259.42
Int. from Jan. 30, 1882, to July 1, 1882, 5 m. 1 d. .	6.53
Amount due July 1, 1882 . . . . . Ans.	<u>\$ 265.95</u>

40.  $800 \times 4 \text{ mo.} = 3200$  months' credit due me.  
 $\frac{100}{200} \times 2 \text{ " } = \frac{200}{200} \text{ " " used.}$   
 $\frac{200}{500} \times 3 \text{ " } = \frac{600}{2400} \text{ " " "}$   
 $\frac{500}{4\frac{1}{2}} \text{ " " still due me.}$   
 $4\frac{1}{2} \text{ mo.} - 4 \text{ mo.} = \frac{1}{2} \text{ mo.} = 24 \text{ days, Ans.}$

## Article 348.

27.  $14 : 7 = 18 : 9$   $\frac{7 \times \overset{9}{18}}{\cancel{14}^2} = 9, \text{ Ans.}$
28.  $5 : 20 = 15 : 60$   $\frac{5 \times \overset{3}{\cancel{60}}}{20} = 15, \text{ Ans.}$
29.  $40 : 8 = 65 : 13$   $\frac{8 \times \overset{5}{\cancel{65}}}{13} = 40, \text{ Ans.}$
30.  $648 : 243 = 24 : 9$   $\frac{\overset{9}{\cancel{243}} \times \cancel{24}}{\cancel{648}^{27}} = 9, \text{ Ans.}$

$$31. \frac{1}{3} : \frac{1}{3} :: 4 : 8 \quad \frac{1 \times \overset{2}{8}}{\underset{3}{6} \times \underset{4}{4}} = \frac{1}{3}, \text{ Ans.}$$

$$32. 45 : 24 :: 15 : 8 \quad \frac{\overset{8}{24} \times \overset{15}{15}}{\underset{3}{45}} = 8, \text{ Ans.}$$

$$33. 30 : 9 :: 60 : 18 \quad \frac{\overset{30}{9} \times \overset{60}{60}}{\underset{2}{18}} = 30, \text{ Ans.}$$

$$34. 5 : \frac{1}{2} :: \$75.00 : \$7.50 \quad \frac{5 \times 2 \times 7.50}{1} = \$75, \text{ Ans.}$$

**Article 349.**

$$36. 12 : 30 :: \$51 : \$x \quad \frac{\overset{5}{30} \times 51}{\underset{2}{12}} = \$127.50, \text{ Ans.}$$

$$37. 183 : 61 = \$273 : \$x \quad \frac{\overset{91}{61} \times \overset{273}{273}}{\underset{3}{183}} = \$91, \text{ Ans.}$$

$$38. 16 : 48 = 30 : x \quad \frac{\overset{3}{48} \times 30}{\underset{16}{48}} = 90 \text{ men, Ans.}$$

$$39. 20 : 24 = 15 : x \quad \frac{\overset{6}{24} \times \overset{3}{15}}{\underset{4}{20}} = 18 \text{ days, Ans.}$$

**Article 350.**

$$40. 15 : 79 :: \$120 : \$x \quad \frac{79 \times \overset{8}{120}}{\cancel{15}} = \$632, \text{ Ans.}$$

$$41. 7 : 27 :: \$5.58 : \$x \quad \frac{27 \times \overset{84}{\cancel{5.58}}}{\cancel{7}} = \$22.68, \text{ Ans.}$$

$$42. 11 : 47 :: 319 : x \quad \frac{47 \times \overset{29}{\cancel{319}}}{\cancel{11}} = 1363 \text{ miles, Ans.}$$

$$43. 36 : 27 :: 12 : x \quad \frac{\overset{9}{\cancel{27}} \times \cancel{12}}{\cancel{36}} = 9 \text{ days, Ans.}$$

$$44. 98 : 7 :: \$441 : \$x \quad \frac{\overset{63}{7} \times \cancel{441}}{\cancel{98}} = \$31\frac{1}{2}, \text{ Ans.}$$

$$45. 24 : 18 :: 15 : x \quad \frac{\overset{3}{18} \times 15}{\cancel{24}} = 11\frac{1}{4} \text{ days, Ans.}$$

$$46. 2700 : 2100 :: 9 : x \quad \frac{\overset{7}{\cancel{2100}} \times 9}{\cancel{2700}} = 7 \text{ mo., Ans.}$$

$$47. 4\frac{1}{2} : 19\frac{1}{2} :: \$2\frac{1}{2} : \$x \quad \frac{8 \times \cancel{39} \times 23}{\cancel{39} \times 2 \times 8} = \$11\frac{1}{2}, \text{ Ans.}$$

$$48. 54 : 74 :: 30 : x \quad \frac{74 \times \overset{5}{30}}{\underset{9}{54}} = 41\frac{1}{2} \text{ days, Ans.}$$

$$49. 2\frac{3}{4} : 3\frac{1}{4} :: 6336 : x \quad \frac{3 \times 13 \times \overset{198}{\cancel{6336}}}{\underset{4}{8} \times \underset{4}{4}} = 7722, \text{ Ans.}$$

$$50. 3\frac{3}{4} : 4\frac{1}{2} :: \$27.50 : x \quad \frac{4 \times 37 \times \overset{2.75}{\cancel{27.50}}}{\underset{3}{15} \times \underset{2}{8}} = \$33.91\frac{1}{2}, \text{ Ans.}$$

$$51. 108 : 72 :: 288 : x \quad \frac{\overset{24}{72} \times \overset{8}{\cancel{288}}}{\underset{3}{108}} = 192 \text{ men.}$$

288 men — 192 men = 96 men, Ans.

$$52. 3\frac{1}{2} : 12\frac{1}{2} :: \$11.37\frac{1}{2} : x \quad \frac{2 \times 97 \times \overset{3.25}{\cancel{22.75}}}{\underset{2}{7} \times \underset{2}{8} \times \underset{2}{2}} = \$39.40\frac{1}{2}, \text{ Ans.}$$

### Article 352.

$$54. \left. \begin{array}{l} 3 : 2 \\ 2 : 6 \end{array} \right\} :: 108 : x \quad \frac{\overset{2}{2} \times \underset{3}{6} \times 108}{\underset{2}{3} \times \underset{2}{2}} = 216, \text{ Ans.}$$

$$55. \left. \begin{array}{l} \$500 : \$250 \\ \$175 : \$360 \end{array} \right\} :: 7 : x \quad \frac{\overset{72}{250} \times \overset{360}{\cancel{360}} \times 7}{\underset{2}{500} \times \underset{35}{175}} = 7\frac{1}{2} \text{ y., Ans.}$$

$$56. \left. \begin{array}{l} 76 : 114 \\ 9 : 6 \end{array} \right\} :: 24 : x \quad \frac{\overset{2}{\cancel{114}} \times \overset{2}{6} \times \overset{6}{\cancel{24}}}{\underset{19}{76} \times \underset{3}{9}} = 24 \text{ men, Ans.}$$



$$57. \quad \left. \begin{array}{l} 5 : 10 \\ 10\frac{1}{2} : 14 \end{array} \right\} :: 6 : x \quad \frac{10^2 \times 14^2 \times 6^2 \times 2}{5^2 \times 21^2} = 16 \text{ acres, Ans.}$$

$$58. \quad \left. \begin{array}{l} 28 : 15 \\ 7\frac{1}{2} : 4 \end{array} \right\} :: 16 : x \quad \frac{15^2 \times 4^2 \times 16^2 \times 2}{28^2 \times 15} = 4\frac{1}{2}, \text{ Ans.}$$

$$59. \quad \left. \begin{array}{l} 10 : 15 \\ 8 : 7 \end{array} \right\} :: \$8 : x \quad \frac{15^3 \times 7 \times 8}{10^2 \times 8} = \$10\frac{1}{2}, \text{ Ans.}$$

$$60. \quad \left. \begin{array}{l} 15 : 20 \\ 9 : 12 \end{array} \right\} :: 117 : x \quad \frac{20^4 \times 12^4 \times 117}{15^3 \times 9} = 208 \text{ miles, Ans.}$$

$$61. \quad \left. \begin{array}{l} 96 : 150 \\ 1 : 6 \end{array} \right\} :: 192 : x \quad \frac{150^2 \times 6 \times 192}{96^2 \times 1} = 1800 \text{ tons, Ans.}$$

$$62. \quad \left. \begin{array}{l} 250 : 400 \\ 10 : 12 \end{array} \right\} :: 9 : x \quad \frac{40^4}{400^2 \times 12 \times 9} = 17\frac{7}{8} \text{ days, Ans.}$$

$$63. \quad \left. \begin{array}{l} 6 : 8 \\ 84 : 200 \end{array} \right\} :: 16 : x \quad \frac{8^2 \times 200 \times 16}{6^2 \times 84} = 50\frac{2}{3} \text{ weeks, Ans.}$$

$$64. \quad \left. \begin{array}{l} 6 : 12 \\ 4 : 9 \end{array} \right\} :: 16 : x \quad \frac{12^3 \times 9 \times 16}{4 \times 6^2} = 72 \text{ acres, Ans.}$$

$$65. \quad \left. \begin{array}{l} 20 : 100 \\ 6 : 4 \end{array} \right\} :: 180 : x \quad \frac{100^5 \times 4 \times 180}{20^2 \times 6} = 600 \text{ bricks, Ans.}$$

$$66. \left. \begin{array}{l} 34 : 8 \\ 6 : 36 \\ 9 : 12 \end{array} \right\} :: 90 : x \quad \frac{8 \times 36 \times 12 \times 90}{34 \times 6 \times 9} = 169\frac{7}{17} \text{ cd., Ans.}$$

$$67. \left. \begin{array}{l} 30 : 12 \\ 30 : 300 \\ 6 : 8 \\ 3 : 6 \\ 8 : 12 \end{array} \right\} :: 15 : x \quad \frac{12 \times 300 \times 8 \times 6 \times 12 \times 15}{30 \times 30 \times 6 \times 3 \times 8} = 240 \text{ days, Ans.}$$

$$68. \left. \begin{array}{l} 20 : 12 \\ 2\frac{1}{2} : 3 \end{array} \right\} :: \$4 : \$x \quad \frac{12 \times 3 \times 4}{20 \times 2\frac{1}{2}} = \$2.88, \text{ Ans.}$$

$$69. \left. \begin{array}{l} 67\frac{1}{2} : 450 \\ 18 : 8 \\ 3\frac{3}{4} : 4\frac{1}{2} \end{array} \right\} :: 2\frac{1}{2} : x \quad \frac{2 \times 8 \times 9 \times 5 \times 6 \times 450}{18 \times 18 \times 2 \times 2 \times 23} = 8\frac{1}{3} \text{ ft., Ans.}$$

$$70. \left. \begin{array}{l} 48 : 52 \\ 8 : 14 \end{array} \right\} :: \$1200 : \$x \quad \frac{52 \times 14 \times 1200}{48 \times 8} = \$2275.$$

$$\$2275 \div 12 = \$189\frac{7}{12}, \text{ per month, Ans.}$$

### Article 356.

$$7. \$6000 + \$9000 + \$5000 = \$20000, \text{ the capital.}$$

$$\text{A's stock} = \frac{6000}{20000} = \frac{3}{10}; \frac{3}{10} \text{ of } \$1680 = \$504, \text{ A's gain.}$$

$$\text{B's " } = \frac{9000}{20000} = \frac{9}{20}; \frac{9}{20} \text{ of } \$1680 = \$756, \text{ B's gain.}$$

$$\text{C's " } = \frac{5000}{20000} = \frac{1}{4}; \frac{1}{4} \text{ of } \$1680 = \$420, \text{ C's gain.}$$

**Article 357.**

8. \$1280 + \$1760 + \$1920 = \$4960, the capital.

$$\text{A's stock} = \frac{1280}{4960} = \frac{8}{31}; \frac{8}{31} \text{ of } \$2790 = \$720, \text{ A's gain.}$$

$$\text{B's " } = \frac{1760}{4960} = \frac{11}{31}; \frac{11}{31} \text{ of } \$2790 = \$990, \text{ B's "}$$

$$\text{C's " } = \frac{1920}{4960} = \frac{12}{31}; \frac{12}{31} \text{ of } \$2790 = \$1080, \text{ C's "}$$

9. \$1750 + \$2100 + \$2650 = \$6500, the capital.

$$\text{A's stock} = \frac{1750}{6500} = \frac{7}{26}; \frac{7}{26} \text{ of } \$4225 = \$1137.50, \text{ A's share.}$$

$$\text{B's " } = \frac{2100}{6500} = \frac{21}{65}; \frac{21}{65} \text{ of } \$4225 = \$1365, \text{ B's share.}$$

$$\text{C's " } = \frac{2650}{6500} = \frac{53}{130}; \frac{53}{130} \text{ of } \$4225 = \$1722.50, \text{ C's share.}$$

10. \$1200 + \$1600 = \$2800, the capital.

$$\text{Hall's stock} = \frac{1200}{2800} = \frac{3}{7}; \frac{3}{7} \text{ of } \$728 = \$312, \text{ Hall's gain.}$$

$$\text{Bishop's " } = \frac{1600}{2800} = \frac{4}{7}; \frac{4}{7} \text{ of } \$728 = \$416, \text{ Bishop's gain.}$$

11. 400 bbl. + 600 bbl. + 400 bbl. = 1400 bbl.

$$\text{B's stock} = \frac{400}{1400} = \frac{2}{7}; \frac{2}{7} \text{ of } 360 \text{ bbl.} = 102\frac{2}{7} \text{ bbl., B's loss.}$$

$$\text{C's " } = \frac{600}{1400} = \frac{3}{7}; \frac{3}{7} \text{ of } 360 \text{ " } = 154\frac{2}{7} \text{ " C's "}$$

$$\text{D's " } = \frac{400}{1400} = \frac{2}{7}; \frac{2}{7} \text{ of } 360 \text{ " } = 102\frac{2}{7} \text{ " D's "}$$

12. 8 horses + 6 horses + 10 horses = 24 horses.

$$\text{A's stock} = \frac{8}{24} = \frac{1}{3}; \frac{1}{3} \text{ of } \$300 = \$100, \text{ A's share.}$$

$$\text{B's " } = \frac{6}{24} = \frac{1}{4}; \frac{1}{4} \text{ of } \$300 = \$75, \text{ B's share.}$$

$$\text{C's " } = \frac{10}{24} = \frac{5}{12}; \frac{5}{12} \text{ of } \$300 = \$125, \text{ C's share.}$$

13. \$1400 + \$600 = \$2000, A's and B's stock.

$$\$180 - \$60 = \$120, \text{ A's and B's gain.}$$

$$\text{A's stock} = \frac{1400}{2000} = \frac{7}{10}; \frac{7}{10} \text{ of } \$120 = \$84, \text{ A's gain.}$$

$$\text{B's " } = \frac{600}{2000} = \frac{3}{10}; \frac{3}{10} \text{ of } \$120 = \$36, \text{ B's "}$$

$$\text{C's gain} = \frac{60}{180} \text{ of whole gain} = \frac{1}{3} \text{ of whole gain.}$$

$$\text{C's stock} = \frac{1}{3} \text{ of whole stock.}$$

$$\frac{2}{3} \text{ of stock} = \$2000; \frac{1}{3} = \frac{1}{2} \text{ of } \$2000 = \$1000, \text{ C's stock}$$

$$125 \text{ bbl. cost } \$1000.$$

$$1 \text{ bbl. cost } \$1000 \div 125 = \$8.$$

### Article 358.

15. A's \$750 for 4 mo. = \$3000 for 1 mo.

$$\text{B's } \$850 \text{ " } 8 \text{ " } = 6800 \text{ "}$$

$$\text{C's } \$800 \text{ " } 12 \text{ " } = 9600 \text{ "}$$

The entire stock is the same as \$19400 "

$$\frac{3000}{19400} = \frac{15}{97}; \frac{15}{97} \text{ of } \$640 = \$98.96\frac{8}{9}, \text{ A's loss.}$$

$$\frac{6800}{19400} = \frac{34}{97}; \frac{34}{97} \text{ of } \$640 = \$224.32\frac{8}{9}, \text{ B's "}$$

$$\frac{9600}{19400} = \frac{48}{97}; \frac{48}{97} \text{ of } \$640 = \$316.70\frac{1}{9}, \text{ C's "}$$

16. A's \$5000 for 8 mo. = \$40000 for 1 mo.

B's \$4000 " 12 " = \$48000 "

C's \$3000 " 15 " = \$45000 "

The entire stock is the same as \$133000 "

$$\frac{40000}{133000} = \frac{40}{133}; \frac{40}{133} \text{ of } \$1330 = \$400, \text{ A pays.}$$

$$\frac{48000}{133000} = \frac{48}{133}; \frac{48}{133} \text{ of } \$1330 = \$480, \text{ B "}$$

$$\frac{45000}{133000} = \frac{45}{133}; \frac{45}{133} \text{ of } \$1330 = \$450, \text{ C "}$$

17. A's 30 horses for 33 days = 990 horses for 1 day.

B's 21 " 42 " = 882 " " "

The entire stock is the same as 1872 " " "

$$\frac{990}{1872} = \frac{55}{104}; \frac{55}{104} \text{ of } \$46.80 = \$24.75, \text{ A pays.}$$

$$\frac{882}{1872} = \frac{49}{104}; \frac{49}{104} \text{ of } \$46.80 = \$22.05, \text{ B "}$$

18. A's \$500 for 9 mo. = \$4500 for 1 mo.

B's \$700 " 12 " = \$8400 "

C's \$400 " 15 " = \$6000 "

The entire stock is the same as \$18900 "

$$\frac{4500}{18900} = \frac{5}{21}; \frac{5}{21} \text{ of } \$300 = \$71\frac{2}{3}, \text{ A's loss.}$$

$$\frac{8400}{18900} = \frac{4}{9}; \frac{4}{9} \text{ of } \$300 = \$133\frac{1}{3}, \text{ B's "}$$

$$\frac{6000}{18900} = \frac{20}{63}; \frac{20}{63} \text{ of } \$300 = \$95\frac{1}{3}, \text{ C's "}$$

19. A's \$ 6000 for 6 mo. = \$ 36000 for 1 mo.

A's \$ 10000 " = 60000 "

A's entire stock is the same as \$ 96000 "

B's \$ 12000 for 8 mo. = \$ 96000 "

B's \$ 6000 " 4 " = 24000 "

B's entire stock is the same as \$ 120000 "

\$ 96000 + \$ 120000 = \$ 216000, the capital.

$\frac{96000}{216000} = \frac{4}{9}$ ;  $\frac{4}{9}$  of \$ 2160 = \$ 960, A's gain.

$\frac{120000}{216000} = \frac{5}{9}$ ;  $\frac{5}{9}$  of \$ 2160 = \$ 1200, B's "

20. A's \$ 500 for 4 mo. = \$ 2000 for 1 mo.

A's \$ 800 " 8 " = 6400 "

A's entire stock is the same as \$ 8400 "

B's \$ 400 for 6 mo. = \$ 2400 for 1 mo.

B's \$ 900 " = 5400 "

B's entire stock is the same as \$ 7800 "

\$ 8400 + \$ 7800 = \$ 16200, the capital.

$\frac{8400}{16200} = \frac{42}{81}$ ;  $\frac{42}{81}$  of \$ 2400 = \$ 1244 $\frac{4}{9}$ , A's gain.

$\frac{7800}{16200} = \frac{39}{81}$ ;  $\frac{39}{81}$  of \$ 2400 = \$ 1155 $\frac{5}{9}$ , B's "

21. Wood's \$ 6000 for 12 mo. = \$ 72000 for 1 mo.

Furbush's \$ 5000 for 10 mo. = 50000 "

Wood's and Furbush's stock = \$ 122000 "

Interest of \$ 4000 for 6 mo. at 6% = \$ 120.

$\$ \frac{1200}{2}$  or \$ 600, + \$ 120 = \$ 720, Davis's share of profits.

\$ 3160 - \$ 720 = \$ 2440.

$\frac{72000}{122000} = \frac{36}{61}$ ;  $\frac{36}{61}$  of \$ 2440 = \$ 1440, Wood's share of profits

$\frac{50000}{122000} = \frac{25}{61}$ ;  $\frac{25}{61}$  of \$ 2440 = \$ 1000, Furbush's " " "

22. A's \$ 2000 for 7 mo. = \$ 14000 for 1 mo.

A's \$ 6000 " 5 " = 30000 "

A's entire stock = \$ 44000 "

B's \$ 3000 for 9 " = \$ 27000 "

B's \$ 2000 " 3 " = 6000 "

B's entire stock = \$ 33000 "

C's \$ 5000 for 8 " = \$ 40000 "

\$ 44000 + \$ 33000 + \$ 40000 = \$ 117000, entire stock for 1 mo.

$\frac{44000}{117000} = \frac{44}{117}$ ;  $\frac{44}{117}$  of \$ 5850 = \$ 2200, A's gain.

$\frac{33000}{117000} = \frac{33}{117}$ ;  $\frac{33}{117}$  of \$ 5850 = \$ 1650, B's "

$\frac{40000}{117000} = \frac{40}{117}$ ;  $\frac{40}{117}$  of \$ 5850 = \$ 2000, C's "

### Article 363.

8. 529.	12. 15 $\frac{1}{2}$ .	16. 0.003375.
9. 4096.	13. 12.96.	17. 12.25.
10. 28561.	14. 15625.	18. 203 $\frac{1}{8}$ .
11. $\frac{2}{18}$ .	15. 161051.	19. 0.000343.

### Article 375.

26. 92'16 ( 96, Ans.	27. 2'72'25 ( 165, Ans.
81	1
186 $\overline{) \begin{array}{r} 1116 \\ 1116 \end{array}}$	26 $\overline{) \begin{array}{r} 172 \\ 156 \end{array}}$
	325 $\overline{) \begin{array}{r} 1625 \\ 1625 \end{array}}$

28.  $18'23'29$  ( 427, Ans.

$$\begin{array}{r}
 16 \\
 82 \overline{) 223} \\
 \underline{164} \\
 847 \overline{) 5929} \\
 \underline{5929}
 \end{array}$$

29.  $71'74'09$  ( 847, Ans.

$$\begin{array}{r}
 64 \\
 164 \overline{) 774} \\
 \underline{656} \\
 1687 \overline{) 11809} \\
 \underline{11809}
 \end{array}$$

30.  $94'86'76$  ( 974, Ans.

$$\begin{array}{r}
 81 \\
 187 \overline{) 1386} \\
 \underline{1309} \\
 1944 \overline{) 7776} \\
 \underline{7776}
 \end{array}$$

31.  $6'70'81$  ( 2.59, Ans.

$$\begin{array}{r}
 4 \\
 45 \overline{) 270} \\
 \underline{225} \\
 509 \overline{) 4581} \\
 \underline{4581}
 \end{array}$$

32.  $4'20'25$  ( 2.05, Ans.

$$\begin{array}{r}
 4 \\
 405 \overline{) 2025} \\
 \underline{2025}
 \end{array}$$

33.  $18'66'24$  ( 43.2, Ans.

$$\begin{array}{r}
 16 \\
 83 \overline{) 266} \\
 \underline{249} \\
 862 \overline{) 1724} \\
 \underline{1724}
 \end{array}$$

34.  $0'00'94'09$  ( 0.097, Ans.

$$\begin{array}{r}
 00 \\
 \hline
 94 \\
 81 \\
 187 \overline{) 1309} \\
 \underline{1309}
 \end{array}$$

35.  $0'05'62'50$  ( 0.237+, Ans.

$$\begin{array}{r}
 04 \\
 43 \overline{) 162} \\
 \underline{129} \\
 467 \overline{) 3350} \\
 \underline{3269} \\
 81
 \end{array}$$

36.  $0'94'09$  ( 0.97, Ans.

$$\begin{array}{r}
 81 \\
 187 \overline{) 1309} \\
 \underline{1309}
 \end{array}$$

37.  $7'78'41$  ( 279, Ans.

$$\begin{array}{r}
 4 \\
 47 \overline{) 378} \\
 \underline{329} \\
 549 \overline{) 4941} \\
 \underline{4941}
 \end{array}$$



38.  $16.'24/09$  (4.03, Ans.

$$\begin{array}{r} 16 \\ 803 \overline{) 2409} \\ \underline{2409} \end{array}$$

39.  $14.'89/96$  (3.86, Ans.

$$\begin{array}{r} 9 \\ 68 \overline{) 589} \\ \underline{544} \\ 766 \overline{) 4596} \\ \underline{4596} \end{array}$$

40.  $39.'06/25$  (6.25, Ans.

$$\begin{array}{r} 36 \\ 122 \overline{) 306} \\ \underline{244} \\ 1245 \overline{) 6225} \\ \underline{6225} \end{array}$$

41.  $5'38.'00/00$  (23.19+, Ans.

$$\begin{array}{r} 4 \\ 43 \overline{) 138} \\ \underline{129} \\ 461 \overline{) 900} \\ \underline{461} \\ 4638 \overline{) 43900} \\ \underline{41742} \\ 2158 \end{array}$$

42.

$71.'00/00/00$  (8.426+, Ans.

$$\begin{array}{r} 64 \\ 164 \overline{) 700} \\ \underline{656} \\ 1682 \overline{) 4400} \\ \underline{3364} \\ 16846 \overline{) 103600} \\ \underline{101076} \\ 2524 \end{array}$$

43.

$0.'00/20/00/00$  (0.0447+, Ans.

$$\begin{array}{r} 16 \\ 84 \overline{) 400} \\ \underline{336} \\ 887 \overline{) 6400} \\ \underline{6209} \\ 191 \end{array}$$

**Article 376.**

45.  $\sqrt{\frac{3721}{7569}} = \frac{\sqrt{3721}}{\sqrt{7569}} = \frac{61}{87}$ , Ans.

46.  $\sqrt{\frac{1899}{10339}} = \frac{\sqrt{9}}{\sqrt{49}} = \frac{3}{7}$ , Ans.

$$47. \sqrt{60\frac{1}{8}} = \frac{\sqrt{961}}{\sqrt{16}} = \frac{31}{4} = 7\frac{3}{4}, \text{ Ans.}$$

$$48. \sqrt{37\frac{3}{4}} = \frac{\sqrt{1849}}{\sqrt{49}} = \frac{43}{7} = 6\frac{1}{7}, \text{ Ans.}$$

$$49. \sqrt{49\frac{1}{8}} = \sqrt{49.444444+} = 7.031+, \text{ Ans.}$$

$$50. \sqrt{\frac{450}{2048}} = \frac{\sqrt{225}}{\sqrt{1024}} = \frac{15}{32}, \text{ Ans.}$$

$$51. \sqrt{72\frac{1}{4}} = \frac{\sqrt{289}}{\sqrt{4}} = \frac{17}{2} = 8\frac{1}{2}, \text{ Ans.}$$

$$52. \sqrt{\frac{30}{32}} = \sqrt{0.9375} = 0.968+, \text{ Ans.}$$

$$53. \sqrt{\frac{3}{4} + \frac{5}{6} + \frac{6}{9}} = \sqrt{2.25} = 1.5, \text{ Ans.}$$

$$54. \sqrt{981\frac{1}{9}} = \frac{\sqrt{8836}}{\sqrt{9}} = \frac{94}{3} = 31\frac{1}{3}, \text{ Ans.}$$

$$55. \sqrt{146\frac{4}{9}} = \sqrt{146.625} = 12.108+, \text{ Ans.}$$

$$56. \sqrt{81\frac{9}{25}} = \sqrt{81.36} = 9.019+, \text{ Ans.}$$

$$57. \sqrt{\frac{7}{8}} = \sqrt{0.875} = 0.935+, \text{ Ans.}$$

$$58. \sqrt{\frac{11}{16}} = \sqrt{0.6875} = 0.829+, \text{ Ans.}$$

59.  $22'65'76$  (476 men, Ans.

$$\begin{array}{r}
 16 \\
 87 \overline{) 665} \\
 \underline{609} \\
 946 \overline{) 5676} \\
 \underline{5676}
 \end{array}$$

60.

$$\begin{array}{l}
 3 \text{ A. } 1 \text{ sq. rd.} = 481 \text{ sq. rd.} \\
 5 \text{ " } 69 \text{ " } = 869 \text{ " } \\
 6 \text{ " } 91 \text{ " } = 1051 \text{ " } \\
 481 \text{ sq. rd.} + 869 \text{ sq. rd.} + 1051 \text{ sq. rd.} = \\
 2401 \text{ sq. rd.}
 \end{array}$$

$$\sqrt{2401} = 49 \text{ rd., Ans.}$$

**Article 384.**

64.

 $91'125$  (45, Ans.

$$\begin{array}{r}
 64 \\
 40^2 \times 3 = 4800 \\
 40 \times 5 \times 3 = 600 \\
 5^2 = 25 \\
 \hline
 5425 \quad 27125
 \end{array}$$

65.

 $421'875$  (75, Ans.

$$\begin{array}{r}
 343 \\
 70^2 \times 3 = 14700 \\
 70 \times 5 \times 3 = 1050 \\
 5^2 = 25 \\
 \hline
 15775 \quad 78875
 \end{array}$$

66.

 $571'787$  (83, Ans.

$$\begin{array}{r}
 512 \\
 80^2 \times 3 = 19200 \\
 80 \times 3 \times 3 = 720 \\
 3^2 = 9 \\
 \hline
 19929 \quad 59787
 \end{array}$$

67.

912.'673 ( 9.7, Ans.

729

$90^2 \times 3 =$	24300		183673
$90 \times 7 \times 3 =$	1890		
$7^2 =$	49		
	<u>26239</u>		183673

68.

3'796'416 ( 156, Ans.

1

$10^2 \times 3 =$	300		2796
$10 \times 5 \times 3 =$	150		
$5^2 =$	25		
	<u>475</u>		2375
$150^2 \times 3 =$	67500		421416
$150 \times 6 \times 3 =$	2700		
$6^2 =$	36		
	<u>70236</u>		421416

69.

12'977'875 ( 235, Ans.

8

$20^2 \times 3 =$	1200		4977
$20 \times 3 \times 3 =$	180		
$3^2 =$	9		
	<u>1389</u>		4167
$230^2 \times 3 =$	158700		810875
$230 \times 5 \times 3 =$	3450		
$5^2 =$	25		
	<u>162175</u>		810875

70.

60'236.'288 ( 39.2, Ans.

27

$30^2 \times 3 =$	2700	33236
$30 \times 9 \times 3 =$	810	
$9^2 =$	81	
	3591	32319
$390^2 \times 3 =$	456300	917288
$390 \times 2 \times 3 =$	2340	
$2^2 =$	4	
	458644	917288

71.

101'847'563 ( 467, Ans.

64

$40^2 \times 3 =$	4800	37847
$40 \times 6 \times 3 =$	720	
$6^2 =$	36	
	5556	33336
$460^2 \times 3 =$	634800	4511563
$460 \times 7 \times 3 =$	9660	
$7^2 =$	49	
	644509	4511563

72.

258'474'853 ( 637, Ans.

216

$60^2 \times 3 =$	10800	42474
$60 \times 3 \times 3 =$	540	
$3^2 =$	9	
	11349	34047
$630^2 \times 3 =$	1190700	8427853
$630 \times 7 \times 3 =$	13230	
$7^2 =$	49	
	1203979	8427853

73.

6'372.'783'864 ( 18.54, Ans.

1

$10^2 \times 3 =$	300	5372
$10 \times 8 \times 3 =$	240	
$8^2 =$	64	
	<u>604</u>	4832
$180^2 \times 3 =$	97200	540783
$180 \times 5 \times 3 =$	2700	
$5^2 =$	25	
	<u>99925</u>	499625
$1850^2 \times 3 =$	10267500	41158864
$1850 \times 4 \times 3 =$	22200	
$4^2 =$	16	
	<u>10289716</u>	41158864

75.

64'481.'201 ( 40.1, Ans.

64

$400^2 \times 3 =$	480000	481201
$400 \times 1 \times 3 =$	1200	
$1^2 =$	1	
	<u>481201</u>	481201

76.

37'259'704 ( 334, Ans.

27

$30^2 \times 3 =$	2700	10259
$30 \times 3 \times 3 =$	270	
$3^2 =$	9	
	<u>2979</u>	8937
$330^2 \times 3 =$	326700	1322704
$330 \times 4 \times 3 =$	3960	
$4^2 =$	16	
	<u>330676</u>	1322704

77.

0.'000'001'728 ( 0.012, Ans.

	1	
$10^3 \times 3 =$	300	728
$10 \times 2 \times 3 =$	60	
$2^2 =$	4	
	<u>364</u>	728

78.

1'860'867 ( 123, Ans.

	1	
$10^3 \times 3 =$	300	860
$10 \times 2 \times 3 =$	60	
$2^2 =$	4	
	<u>364</u>	728
$120^2 \times 3 =$	43200	132867
$120 \times 3 \times 3 =$	1080	
$3^2 =$	9	
	<u>44289</u>	132867

79.

8.'144'865'728 ( 2.012, Ans.

	8	
$200^3 \times 3 =$	120000	144865
$200 \times 1 \times 3 =$	600	
$1^2 =$	1	
	<u>120601</u>	120601
$2010^2 \times 3 =$	12120300	24264728
$2010 \times 2 \times 3 =$	12060	
$2^2 =$	4	
	<u>12132364</u>	24264728

80.

0.'075'686'967 ( 0.423, Ana.

	64	
$40^2 \times 3 =$	4800	11686
$40 \times 2 \times 3 =$	240	
$2^2 =$	4	
	<u>5044</u>	10088
$420^2 \times 3 =$	529200	1598967
$420 \times 3 \times 3 =$	3780	
$3^2 =$	9	
	<u>532989</u>	1598967

81.

0.'008'649'000 ( 0.205+, Ana.

	8	
$200^2 \times 3 =$	120000	649000
$200 \times 5 \times 3 =$	3000	
$5^2 =$	25	
	<u>123025</u>	615125
		<u>33875</u>

82.

0.'000'007'000 ( 0.019+, Ana.

	1	
$10^2 \times 3 =$	300	6000
$10 \times 9 \times 3 =$	270	
$9^2 =$	81	
	<u>651</u>	5859
		<u>141</u>



83.

25'000'000 (2.92+, Ans.

	8	
$20^2 \times 3 =$	1200	17000
$20 \times 9 \times 3 =$	540	
$9^2 =$	81	
	1821	16389
$290^2 \times 3 =$	252300	611000
$290 \times 2 \times 3 =$	1740	
$2^2 =$	4	
	254044	508088
		102912

**Article 385.**

$$85. \quad \sqrt[3]{\frac{68921}{59319}} = \frac{\sqrt[3]{68921}}{\sqrt[3]{59319}} = \frac{41}{39} = 1\frac{2}{39}, \text{ Ans.}$$

$$86. \quad \sqrt[3]{49\frac{8}{27}} = \frac{\sqrt[3]{1331}}{\sqrt[3]{27}} = \frac{11}{3} = 3\frac{2}{3}, \text{ Ans.}$$

$$87. \quad \sqrt[3]{\frac{3}{5}} = \sqrt[3]{0.6} = 0.84+, \text{ Ans.}$$

$$88. \quad \sqrt[3]{\frac{5}{27}} = \sqrt[3]{0.185185+} = 0.57, \text{ Ans.}$$

$$89. \quad \sqrt[3]{81\frac{1}{11}} = \sqrt[3]{81.454545+} = 4.33+, \text{ Ans.}$$

$$90. \quad \sqrt[3]{166\frac{2}{3}} = \sqrt[3]{166.666666+} = 5.503+, \text{ Ans.}$$

$$91. \quad 2150.42 \times 8 = 17203.36 \text{ cu. in.}$$

$$\sqrt[3]{17203.36} = 25.81+ \text{ in., Ans.}$$

**Article 390.**

$$3. 20^2 + 15^2 = 400 + 225 = 625; \sqrt{625} = 25 \text{ ft., Ans.}$$

$$4. 157^2 - 132^2 = 24649 - 17424 = 7225$$

$$\sqrt{7225} = 85 \text{ ft., Ans.}$$

$$5. 48^2 + 36^2 = 2304 + 1296 = 3600; \sqrt{3600} = 60 \text{ mi., Ans.}$$

$$6. 400^2 - 100^2 = 160000 - 10000 = 150000$$

$$\sqrt{150000} = 387.30 \text{ ft., Ans.}$$

$$7. 40^2 + 36^2 = 1600 + 1296 = 2896$$

$$\sqrt{2896} = 53.81 + \text{rd., Ans.}$$

$$8. 32^2 - 25^2 = 1024 - 625 = 399; \sqrt{399} = 19.97 + \text{ft.}$$

$$32^2 - 20^2 = 1024 - 400 = 624; \sqrt{624} = 24.97 + \text{ft.}$$

$$19.97 + \text{ft.} + 24.97 + \text{ft.} = 44.94 + \text{ft., Ans.}$$

**Article 394.**

$$9. 36 \text{ ft.} \times 15 \text{ ft.} = 540 \text{ sq. ft., Ans.}$$

$$10. 16 \text{ ft.} \times 12 \text{ ft.} = 192 \text{ sq. ft., Ans.}$$

$$11. 37 \text{ ft.} \times 27 \text{ ft.} = 999 \text{ sq. ft.; } 40 \text{ ft.} \times 20 \text{ ft.} = 800 \text{ sq. ft.}$$

$$999 \text{ sq. ft.} - 800 \text{ sq. ft.} = 199 \text{ sq. ft., Ans.}$$

**Article 396.**

$$12. \frac{120 + 100}{2} \times 85 = 9350 \text{ sq. ft., Ans.}$$

$$13. 60^{\text{cm}} = 0.6^{\text{m}}; 40^{\text{cm}} = 0.4^{\text{m}}; \frac{0.6^{\text{m}} + 0.4^{\text{m}}}{2} = 0.5^{\text{m}}$$

$$0.5^{\text{m}} \times 6^{\text{m}} = 3^{\text{sq m}}, \text{ Ans.}$$

$$14. \quad \frac{131 \text{ yd.} + 243 \text{ yd.}}{2} \times 220 = 41140 \text{ sq. yd.}$$

$$41140 \text{ sq. yd.} = 8\frac{1}{2} \text{ acres, Ans.}$$

**Article 398.**

$$16. \quad \frac{14 \text{ ft.} + 18 \text{ ft.}}{2}, \text{ or } 16 \text{ ft.,} \times 65 \text{ ft.,} = 1040 \text{ sq. ft., Ans.}$$

$$17. \quad \frac{58\frac{1}{2} \text{ ft.} + 65\frac{1}{2} \text{ ft.}}{2}, \text{ or } 62\frac{1}{2} \text{ ft.,} \times 126\frac{1}{2} \text{ ft.} = 7843\frac{3}{2} \text{ sq. ft.}$$

$$7843\frac{3}{2} \text{ sq. ft.} \div 9 = 871\frac{1}{3}\frac{7}{6} \text{ sq. yd., Ans.}$$

**Article 400.**

$$18. \quad 15 \times 6 = 90 \text{ cu. ft., Ans.}$$

$$19. \quad 6^m = 600^{\text{cm}}; 18 \times 20 \times 600 = 216000^{\text{cu cm}}, \text{ Ans.}$$

$$20. \quad 20 \text{ ft. } 6 \text{ in.} = 246 \text{ in.}; 1075.30 \times 246 = 264523.8 \text{ cu. in.} =$$

$$153\frac{233}{2880} \text{ cu. ft., Ans.}$$

**Article 403.**

$$21. \quad 14 \text{ ft. } 3 \text{ in.} = 14.25 \text{ ft.}; 14.70 \times \frac{14.25}{3} = 69.825 \text{ cu. ft., Ans.}$$

$$22. \quad 12.5^m \div 3.1416 = 3.979^m, \text{ diameter of base.}$$

$$\frac{3.979}{2} \times \frac{12.5}{2} = 12.434375, \text{ area of base.}$$

$$12.434375 \times \frac{15.06}{3} = 62.42+^{\text{cu m}}, \text{ Ans.}$$

$$23. \quad 693^2 = 480249 \text{ sq. ft., area of base.}$$

$$480249 \times \frac{500}{3} = 80041500 \text{ cu. ft., Ans.}$$

**Article 405.**

25.  $3 \times 3.1416 = 9.4248$  ft., circumference of larger end.

$$\frac{9.4248}{2} \times \frac{3}{2} = 7.0686 \text{ ft., area of base.}$$

$$2.5 \times 3.1416 = 7.854 \text{ ft., circumference of smaller end.}$$

$$\frac{7.854}{2} \times \frac{2.5}{2} = 4.90875, \text{ area of base.}$$

$$7.0686 \times 4.90875 = 34.69799025$$

$$\sqrt{34.69799025} = 5.8905$$

$$7.0686 + 4.90875 + 5.8905 = 17.86785$$

$$17.86785 \times \frac{28.5}{3} = 169.744575 \text{ cu. ft., Ans.}$$

26.  $27 \text{ in.} = \frac{9}{4} \text{ ft.}; \frac{9}{4} \times \frac{9}{4} = \frac{81}{16}; 16 \text{ in.} = \frac{4}{3} \text{ ft.}; \frac{4}{3} \times \frac{4}{3} = \frac{16}{9}$

$$\frac{81}{16} \times \frac{16}{9} = 9; \sqrt{9} = 3; \frac{81}{16} + \frac{16}{9} + 3 = \frac{1417}{144}$$

$$18 \text{ ft. } 8 \text{ in.} = \frac{56}{3} \text{ ft.}; \frac{56}{3} \text{ ft.} \div 3 = \frac{56}{9} \text{ ft.}$$

$$\frac{1417}{144} \times \frac{7}{9} = \frac{9919}{162} = 61\frac{37}{18} \text{ cu. ft., Ans.}$$

**Article 407.**

27.  $25^2$ , or  $625$ ,  $\times 3.1416 = 1963.5$  sq. in., Ans.

28.  $18^2$ , or  $324$ ,  $\times 3.1416 = 1017.8784$  sq. cm

$$1017.8784 \text{ sq. cm} \div 10000 = 0.1017874 \text{ sq. m, Ans.}$$

$$29. 50^3 = 125000; 125000 \times \frac{3.1416}{6} = 65450 \text{ cu. ft., Ans.}$$

$$30. 2100^3 = 9261000000$$

$$9261000000 \times \frac{3.1416}{6} = 4849059600 \text{ cu. mi., Ans.}$$

**Article 409.**

$$32. 12^2 : 8^2 = 72 : x \quad \frac{\overset{32}{\cancel{64}} \times \cancel{72}}{\underset{2}{\cancel{144}}} = 32 \text{ sq. ft., Ans.}$$

$$33. 9 : 6.25 = 120^2 : x^2 \quad \frac{\overset{1600}{\cancel{14400}} \times 6.25}{\underset{9}{\cancel{9}}} = 10000$$

$$\sqrt{10000} = 100 \text{ rd., Ans.}$$

$$34. 100 \text{ rd.} \times 3.1416 = 314.16, \text{ circumference of larger circle.}$$

$$\frac{314.16 \times \overset{25}{\cancel{100}}}{\cancel{2} \times \cancel{2}} = 7854 \text{ sq. ft., area of larger circle.}$$

$$100^2 : 50^2 = 7854 : x$$

$$\frac{\cancel{2500} \times 7854}{\underset{4}{\cancel{10000}}} = 1963.5 \text{ sq. ft., area of smaller circle.}$$

$$7854 \text{ sq. ft.} - 1963.5 \text{ sq. ft.} = 5890.5 \text{ sq. ft., Ans.}$$

$$35. 35^2 : 1.5^2 = 5 : x \quad \frac{2.25 \times \cancel{5}}{\underset{245}{\cancel{1225}}} = \frac{9}{980} \text{ hours, Ans.}$$

$$36. 16^2 : 24^2 = \$30 : x \quad \frac{\overset{9}{\cancel{576}} \times 30}{\underset{4}{\cancel{288}}} = \$67.50, \text{ Ans.}$$

$$37. 15^2 : 45^2 = 105.55 : x \quad \frac{2025 \times 105.55}{225} = 949.95^{\text{m}}, \text{ Ans.}$$

**Article 412.**

$$39. 400 : 600 = 4^3 : x^3 \quad \frac{600 \times 64}{400} = 96$$

$$\sqrt[3]{96} = 4.57 + \text{ft.}, \text{ Ans.}$$

$$40. 16 : 8 = 12^3 : x^3 \quad \frac{8 \times 1728}{16} = 864; \sqrt[3]{864} = 9.5 + \text{in.}$$

$$12 \text{ in.} - 9.5 \text{ in.} = 2.5 \text{ in.}, \text{ Ans.}$$

$$41. 6^3 : 12^3 = 16.50 : x \quad \frac{1728 \times 16.50}{216} = 132^{\text{K}}, \text{ Ans.}$$

$$42. 2000^3 : 8000^3 = 1 : x \quad \frac{64 \times 1}{8} = 8, \text{ Ans.}$$

$$43. (5\frac{1}{2})^3 : (8\frac{1}{2})^3 = 140 : x \quad \frac{8}{1331} \times \frac{35937}{64} \times \frac{35}{140} = 472\frac{1}{2} \text{ lb.}, \text{ Ans.}$$

**Article 413.**

$$49. \$1 \times 1.10 = \$1.10.$$

$$\$7700 \div \$1.10 = \$7000, \text{ present worth of } \$7700.$$

$$\$7000 - \$7000 = 0. \quad \text{Hence they do not differ, Ans}$$

50.  $\$0.32 - \$0.28 = \$0.04$ , loss.

$$\frac{4}{32} = \frac{1}{8}; \quad \frac{1}{8} \text{ of } 100\% = 12\frac{1}{2}\%, \text{ loss, Ans.}$$

51.  $100\% - 10\% = 90\%$ .

$90\% \text{ of } \$40 = \$36$ , what the suit is sold for.

$100\% + 25\% = 125\% ; \$36 = 125\%$ .

$$\frac{\$36}{125} \times 100 = \$28.80, \text{ cost of the suit, Ans.}$$

52.  $\sqrt[3]{\frac{27}{64}} = \frac{3}{4}; \left(\frac{3}{4}\right)^2 = \frac{9}{16}; 33\frac{1}{3}\% = \frac{1}{3}; \frac{1}{3} \text{ of } \frac{9}{16} = \frac{3}{16}, \text{ Ans.}$

53.  $(14 \text{ ft.})^2 = 196 \text{ sq. ft. on 1 face.}$

$196 \text{ sq. ft.} \times 6 = 1176 \text{ sq. ft.} = \text{surface of 6 faces, Ans.}$

54.  $38 - 13 = 25 \text{ States, increase; } \frac{25}{13} \text{ of } 100\% = 192\frac{4}{13}\%, \text{ Ans.}$

55.  $16\frac{2}{3}\% + 20\% = 36\frac{2}{3}\% ; 100\% - 36\frac{2}{3}\% = 63\frac{1}{3}\%.$

$\$5700 = 63\frac{1}{3}\% ; \frac{\$5700}{63\frac{1}{3}} \times 100 = \$9000, \text{ Ans.}$

56.  $100\% - 20\% = 80\%.$

$80\% \text{ of } \$0.80 = \$0.64$ , cost of the books.

$15\% \text{ of } \$1 = \$0.15 ; \$1.00 - \$0.15 = \$0.85.$

$5\% \text{ of } \$0.85 = \$0.04\frac{1}{4}.$

$\$0.85 - \$0.04\frac{1}{4} = \$0.80\frac{3}{4}$ , selling price.

$\$0.80\frac{3}{4} - \$0.64 = \$0.16\frac{3}{4}$ , gain, Ans.

57.  $\$8.50 \times 2000 = \$17000$ , received for flour.

$1\frac{1}{2}\% \text{ of } \$17000 = \$255$ , commission.

$\$255 + \$74 + \$27 = \$356.$

$\$17000 - \$356 = \$16644, \text{ Ans.}$

58.  $62.40 \div .00\frac{1}{4} = \$24960 = \frac{2}{3}$  of value of house.

$$\frac{\$24960}{3} \times 4 = \$33280, \text{ value of the house.}$$

$$\$24960 - \$33280 = \$8320.$$

$$\$8320 + \$62.40 = \$8382.40, \text{ Ans.}$$

59.  $\$25375 = 101\frac{1}{2}\%$  of the purchase money.

$$\frac{\$25375}{101\frac{1}{2}} \times 100 = \$25000, \text{ with which to buy cotton.}$$

$$\$25000 \div \$0.12\frac{1}{2} = 200000 \text{ lb., Ans.}$$

60. The annual income of a share of 6% stock is \$6.

If the cost is \$112, the income is  $\frac{6}{112}$ , or  $\frac{3}{56}$  of the cost.

$$\frac{3}{56} \text{ of } 100\% = 5\frac{5}{14}\% \text{ of the cost, Ans.}$$

61. From May 30, 1878, to Dec. 24, 1881, = 3 y. 6 mo. 24 d.

$$\begin{array}{rcl} 2) \$892 & = & \text{Principal.} \\ \underline{4.46} & = & 1 \text{ month's interest.} \\ 42\frac{1}{2} & = & \text{Time in months.} \\ \underline{892} & & \\ 1784 & & \\ \underline{3568} & & \\ \$190.888 & = & \text{Interest at } 6\%. \\ 47.722 & = & \text{" " } 1\frac{1}{2}\%. \\ \underline{\$143.166} & = & \text{" " } 4\frac{1}{2}\%. \\ 892. & & \end{array}$$

$$\text{Ans. } \$1035.166, \text{ Amount.}$$



62. \$ 600 = 120 % of cost of 1st piano.

$$\frac{\$600}{120} \times 100 = \$500, \text{ cost of 1st piano.}$$

$$\$600 = 80 \% \text{ of cost of 2d piano.}$$

$$\frac{\$600}{80} \times 100 = \$750, \text{ cost of 2d piano.}$$

$$\$600 + \$600 = \$1200, \text{ what was received for both.}$$

$$\$500 + \$750 = \$1250, \text{ cost of both.}$$

$$\$1250 - \$1200 = \$50, \text{ loss, Ans.}$$

63. Principal for 1st 6 mo. . . . .	\$ 1200.00
Interest " " . . . . .	24.00
Principal for 2d 6 mo. . . . .	<u>\$ 1224.00</u>
Interest " " . . . . .	24.48
Principal for 3d 6 mo. . . . .	<u>\$ 1248.48</u>
Interest " " . . . . .	24.97
Principal for 3 mo. 18 d. . . . .	<u>\$ 1273.45</u>
Interest " " " . . . . .	15.28
Compound amount for 1 y. 9 mo. 18 d. .	<u>\$ 1288.73</u>
Given principal . . . . .	1200.00
Compound interest . . . . .	Ans. <u>\$ 88.73</u>

64.  $\$1 \times .08 \times \frac{3}{4} = \$0.06$ , int. of \$ 1 for 9 mo. at 8%.

$$\$1 + \$0.06 = \$1.06, \text{ amount of \$ 1 for 9 mo.}$$

$$\$1500 \div \$1.06 = \$1415.094, \text{ present worth.}$$

$$\$1500 - \$1415.094 = \$84.906, \text{ discount, Ans.}$$

65.  $\$1000 \times .07 = \$70$ , int. of \$ 1000 for 1 year.

$$\$1500 - \$1000 = \$500, \text{ interest.}$$

$$\$500 \div \$70 = 7\frac{1}{7}.$$

Ans.  $7\frac{1}{7}$  years.

## 66.

Principal . . . . .	\$ 1600.00
Int. from Jan. 1, 1879, to July 10, 1879, 6 m. 9 d.	50.40
Amount . . . . .	<u>\$ 1650.40</u>
1st payment . . . . .	200.00
New principal . . . . .	<u>\$ 1450.40</u>
Int. from July 10, 1879, to Aug. 15, 1880, 1y. 1m. 5d.	95.48
Amount . . . . .	<u>\$ 1545.88</u>
2d payment . . . . .	200.00
New principal . . . . .	<u>\$ 1345.88</u>
Int. from Aug. 15, 1880, to May 12, 1881, 8m. 27 d.	59.89
Amount . . . . .	<u>\$ 1405.77</u>
3d payment . . . . .	200.00
New principal . . . . .	<u>\$ 1205.77</u>
Int. from May 12, 1881, to Jan. 1, 1882, 7 m. 20 d.	46.22
Amount due Jan. 1, 1882 . . . . . Ans.	<u>\$ 1251.99</u>

67.  $\$1.87\frac{1}{2} \times 62\frac{2}{3} = \$117.66.$

15% of  $\$117.66 = \$17.65$ , discount.

$\$117.66 - \$17.65 = \$100.01$ , Ans.

## 68.

$\frac{1}{2}\%$  of  $\$8000 = \$40$ , paid for insurance.

$\$8000 + \$40 + \$64 + \$1260 = \$9364$ , whole cost.

Int. of  $\$11000$  for 2 mo. 3 d. at 5% =  $\$96.25$ , bank discount.

$\$11000 - \$96.25 = \$10903.75$ , proceeds of the note.

$\$10903.75 - \$9364 = \$1539.75$ , gain, Ans.

69. Bank discount of  $\$1$  for 4 mo. 3 d. at 4% =  $\$0.013\frac{2}{3}$ .

Proceeds of  $\$1 = \$1 - \$0.013\frac{2}{3} = \$0.986\frac{1}{3}$ .

$\$800 \div 0.986\frac{1}{3} = \$811.08\frac{1}{3}$ , face of the note, Ans.

70.  $\$143\frac{1}{2} + \$\frac{1}{4} = \$143\frac{3}{4}$ , cost of 1 share.

$\$143\frac{3}{4} \times 125 = \$17968\frac{3}{4}$ , Ans.

71. 93 d. after April 10, 1882 = July 12, day of maturity.  
 From May 14 to July 12 = 59 d., term of discount.  
 Int. of \$ 1292 for 59 d. at 6% = \$ 12.70 $\frac{7}{8}$ , bank discount.  
 \$ 1292 - \$ 12.70 $\frac{7}{8}$  = \$ 1279.29 $\frac{1}{8}$ , proceeds, Ans.

72. \$ 1 of exchange = 5.14 francs.

$$8500 \text{ francs} \div 5.14 \text{ francs} = \$ 1653.69+, \text{ Ans.}$$

73.  $\sqrt{0.0625} : (\frac{1}{2})^2 = x : \sqrt[3]{15.625}$ ; or  $.25 : \frac{1}{4} = x : 2.5$   

$$\frac{.25 \times 4 \times 2.5}{1} = 2.5, \text{ Ans.}$$

74. Since the mean proportional between the extremes of a proportion is one of the equal means of the proportion (Art. 346), the mean proportional between two numbers is equal to the square root of their product. Hence,

$$\sqrt{816 \times 97\frac{1}{2}} = \sqrt{79560} = 282.0638+, \text{ Ans.}$$

75.  $\frac{3}{4} \text{ lb.} = 12 \text{ oz.}; 12 \text{ oz.} : \frac{3}{5} \text{ oz.} = \$ \frac{5}{6} : x$

$$\frac{1 \times 3 \times 5}{12 \times 5 \times 6} = \$ \frac{1}{24}, \text{ or } \$ 0.04\frac{1}{6}, \text{ Ans.}$$

76.  $\left. \begin{array}{l} 8 : 12 \\ 10 : 8.50 \end{array} \right\} = 10 \text{ oz.} : x$

$$\frac{3 \quad 4.25}{12 \times 8.50 \times 10} = 12.75 \text{ oz., Ans.}$$

77.  $\left. \begin{array}{l} 31 : 28 \\ 4 : 3 \\ 3\frac{1}{2} : 4\frac{1}{2} \end{array} \right\} = \$ 4 : x$

$$\frac{28 \times 3 \times 13 \times 4 \times 2}{4 \times 3 \times 31 \times 7} = \frac{104}{31} = \$ 3\frac{1}{4}, \text{ or } \$ 3.35\frac{1}{4}, \text{ Ans.}$$

78.  $14 + 12 + 7 = 33$

$\frac{14}{33}$  of \$ 7000 = \$ 2969.69 $\frac{2}{3}$ , 1st child's share.

$\frac{12}{33}$  of \$ 7000 = \$ 2545.45 $\frac{1}{3}$ , 2d " "

$\frac{7}{33}$  of \$ 7000 = \$ 1484.84 $\frac{2}{3}$ , 3d " "

79. Ames's \$ 8000 for 12 mo. = \$ 96000 for 1 mo.

Stevens's \$ 6000 " 12 " = \$ 72000 "

Conant's \$ 5000 " 8 " = \$ 40000 "

Hubbell's \$ 3000 " 5 " = \$ 15000 "

The entire stock = \$ 223000 "

$\frac{96000}{223000} = \frac{96}{223}$ ;  $\frac{96}{223}$  of \$ 12000 = \$ 5165.91 $\frac{2}{3}$ , Ames's share.

$\frac{72000}{223000} = \frac{72}{223}$ ;  $\frac{72}{223}$  of \$ 12000 = \$ 3874.43 $\frac{1}{3}$ , Stevens's "

$\frac{40000}{223000} = \frac{40}{223}$ ;  $\frac{40}{223}$  of \$ 12000 = \$ 2152.46 $\frac{2}{3}$ , Conant's "

$\frac{15000}{223000} = \frac{15}{223}$ ;  $\frac{15}{223}$  of \$ 12000 = \$ 807.17 $\frac{1}{3}$ , Hubbell's "

### 80.

120 rd.  $\times$  80 rd. = 9600 sq. rd., area of 1st lot.

$\sqrt{9600} = 97.979+$  rd. on 1 side of square lot.

97.979 rd.  $\times$  4 = 391.916 rd., perimeter of square lot.

(120 + 80), or 200 rd.,  $\times$  2 = 400 rd., perimeter of rectangular lot.

400 : 391.916 = \$ 320 :  $x$

$\frac{391.916 \times 320}{400} = \$ 313.532+$ , Ans.

81.  $90^2 + 90^2 = 8100 + 8100 = 16200$

$\sqrt{16200} = 127.279+$  ft., Ans.

82. A section of land = 1 sq. mi.

1 mi. = 320 rd., length of each side.

$$320^2 + 320^2 = 102400 + 102400 = 204800$$

$$\sqrt{204800} = 452.54 + \text{rd.}, \text{ Ans.}$$

83.  $\sqrt[3]{25934.336} = 29.6 \text{ ft.}, \text{ Ans.}$

84. 1 quarter-section of land is  $\frac{1}{4}$  mile, or 160 rods, square. She would walk the number of rods on three sides of the square, plus the diagonal of the square.

$$160 \text{ rd.} \times 3 = 480 \text{ rd.}$$

$$160^2 + 160^2 = 25600 + 25600 = 51200$$

$$\sqrt{51200} = 226.274 \text{ rd.}, \text{ diagonal.}$$

$$480 \text{ rd.} + 226.274 \text{ rd.} = 706.274 \text{ rd.}$$

$$706.274 \text{ rd.} = 2 \text{ mi. } 66.274 \text{ rd.}, \text{ Ans.}$$

85.  $32 \times 128 \text{ cu. ft.} = 4096 \text{ cu. ft.}; \sqrt[3]{4096} = 16 \text{ ft.}, \text{ Ans.}$

86.  $60^2 + 40^2 = 3600 + 1600 = 5200$

$$\sqrt{5200} = 72.11 + \text{in.}, \text{ diagonal of 1 side.}$$

$$(72.11 +)^2 + 20^2 = 5200 + 400 = 5600$$

$$\sqrt{5600} = 74.833 + \text{in.}, \text{ Ans.}$$

87. 1 acre = 43560 sq. ft.;  $\sqrt{43560} = 208.71 + \text{ft.}, \text{ Ans.}$

88.  $10 \times 160 \text{ sq. rd.} = 1600 \text{ sq. rd.}$

$$\sqrt{1600} = 40 \text{ rd.}, \text{ length of each side.}$$

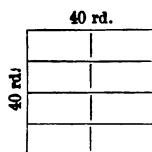
Eight sections of fence, each 40 rd. long, will be required.

$$40 \text{ rd.} \times 8 = 320 \text{ rd.}$$

$$\$0.75 \times 320 = \$240, \text{ Ans.}$$

If the field is divided into 8 lots, each 5 rods wide and 40 rods long, 11 sections of fence, each 40 rods long, will be required.

$$11 \times 40 \times \$0.75 = \$330, \text{ Ans.}$$



$$89. 40^2 - 12^2 = 1600 - 144 = 1456$$

$$\sqrt{1456} = 38.157+ \text{ ft., Ans.}$$

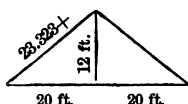
$$90. \sqrt{175616} = 56 \text{ in., length of 1 face.}$$

$$56^2 + 56^2 = 3136 + 3136 = 6272$$

$$\sqrt{6272} = 79.195+ \text{ in., Ans.}$$

$$91. \sqrt{5184} = 72, \text{ the number. } 72^2 = 373248, \text{ Ans.}$$

92.



$$20^2 + 12^2 = 400 + 144 = 544$$

$$\sqrt{544} = 23.323+ \text{ ft., Ans.}$$

$$93. \sqrt{2\frac{1}{9}} = \frac{\sqrt{25}}{\sqrt{9}} = \frac{5}{3}; \quad \sqrt[3]{4\frac{1}{27}} = \frac{\sqrt[3]{125}}{\sqrt[3]{27}} = \frac{5}{3}$$

$$\frac{5}{3} \div \frac{5}{3} = 1, \text{ Ans.}$$

$$94. \sqrt[3]{592704} = 84 \text{ in., length of 1 face.}$$

$$84^2 = 7056 \text{ sq. in., area of 1 face.}$$

$$7056 \text{ sq. in.} \times 6 = 42336 \text{ sq. in., area of 6 faces, Ans.}$$

$$95. 300 \times 2 = 600 \text{ pairs; } \frac{1}{2} \text{ of 6 days} = 3 \text{ days.}$$

$$\left. \begin{array}{l} 300 : 600 \\ 3 : 6 \end{array} \right\} = 8 : x \quad \frac{\overset{2}{600} \times \overset{2}{6} \times 8}{\cancel{300} \times \cancel{6}} = 32 \text{ men.}$$

$$32 \text{ men} - 8 \text{ men} = 24 \text{ men, Ans.}$$

$$96. 6 : 11 = x : 167\frac{1}{2} \quad \frac{6 \times \overset{76}{\cancel{888}}}{\cancel{11} \times 5} = \frac{456}{5} = 91\frac{1}{5}, \text{ Ans.}$$

$$97. \frac{3}{12} : \frac{5}{8} = \frac{6}{24} : \frac{15}{24} = 6 : 15, \text{ or } 2 : 5, \text{ Ans.}$$

$$98. 4\frac{5}{16} : 11\frac{3}{8} = \$1.38 : x \quad \frac{2}{16} \times 91 \times \frac{.02}{1.38} = \$3.64, \text{ Ans.}$$

$$99. 8 : 24 = 24 : x \quad \frac{3}{24} \times 24 = 72 \text{ men, Ans.}$$

$$100. A's \$2000 \text{ for 12 mo.} = \$24000 \text{ for 1 mo.}$$

$$\$24000 \text{ for 1 mo.} = \frac{\$24000}{9}, \text{ or } \$2666\frac{2}{3} \text{ for 9 mo., what}$$

B put in.

Ans. \$2666.66\frac{2}{3}.

$$101. 20 \text{ mi.} \times 5 = 100 \text{ mi., A is in advance of B.}$$

$$25 \text{ mi.} - 20 \text{ mi.} = 5 \text{ mi., B gains in 1 day.}$$

$$\left. \begin{array}{l} 100 \div 5 = 20 \text{ days,} \\ 25 \text{ mi.} \times 20 = 500 \text{ mi.,} \end{array} \right\} \text{ Ans.}$$

$$102. \text{ The 1st will empty } \frac{1}{2}, \text{ the 2d } \frac{1}{3}, \text{ the 3d } \frac{1}{4}, \text{ in 1 hour.}$$

$$\text{Together they will empty } \frac{1}{2} + \frac{1}{3} + \frac{1}{4} = \frac{13}{12} \text{ in 1 hour.}$$

$$\frac{13}{12} : \frac{12}{12} = 1 \text{ h.} : x$$

$$\frac{12 \times 12 \times 1}{13 \times 12} = \frac{12}{13} \text{ h., or 55 min. } 23\frac{1}{13} \text{ sec., Ans.}$$

$$103. 48 : 36 = 144 : x \quad \frac{36 \times 144}{48} = 108 \text{ men.}$$

$$144 \text{ men} - 108 \text{ men} = 36 \text{ men, Ans.}$$

$$104. \left. \begin{array}{l} 20 : 15 \\ 10 : 15 \end{array} \right\} :: 60 \text{ d.} : x$$

$$\frac{15 \times 15 \times 3}{20 \times 10} = \frac{135}{2} = 67\frac{1}{2} \text{ days, Ans.}$$

105.  $\$3 + \$5 + \$8 = \$16$ .

A's stock  $= \frac{3}{16}$ ;  $\frac{3}{16}$  of  $\$2000 = \$375$ , A receives.

B's "  $= \frac{5}{16}$ ;  $\frac{5}{16}$  of  $\$2000 = \$625$ , B receives.

C's "  $= \frac{8}{16}$ ;  $\frac{8}{16}$  of  $\$2000 = \$1000$ , C receives.

106.  $24^2 + 24^2 = 576 + 576 = 1152$

$\sqrt{1152} = 33.941 + \text{ft.} = 407.29 + \text{in.}$ , Ans.

107.  $\sqrt[3]{\frac{9}{8}} = \sqrt[3]{1.125} = 1.04 +$ , Ans.

$1.125'000 (1.04 +$

1

$100^2 \times 3 =$	$30000$	$125000$
$100 \times 4 \times 3 =$	$1200$	
$4^2 =$	$16$	
	<u><math>31216</math></u>	$124864$

108.  $8 \text{ ft. } 6 \text{ in.} = 8.5 \text{ ft.}$   $8.5^2 : x^2 = 1 : 25$

$\frac{72.25 \times 25}{1} = 1806.25$ ;  $\sqrt{1806.25} = 42.5 \text{ ft.}$ , Ans.

109.  $\left(\frac{7}{8}\right)^2 : \left(\frac{3}{4}\right)^2 = 30 \text{ gal.} : x$ ; or,  $\frac{49}{64} : \frac{9}{16} = 30 : x$

$\frac{4}{64} \times 9 \times 30 = \frac{1080}{49} = 22\frac{2}{49} \text{ gal.}$ , Ans.

110  $150 \times 6 \text{ mo.} = 900 \text{ mo.}$

$180 \times 8 \text{ " } = 1440 \text{ "}$

$270 \times 4 \text{ " } = 1080 \text{ "}$

$\frac{600}{3420} \text{ "}$

$5\frac{7}{10} \text{ mo., or } 5 \text{ mo. } 21 \text{ d.}$ , Ans.



111.  $2456 + 735 + 436 = 3627$

$\frac{2456}{3627}$  of 182 men =  $123\frac{871}{3627}$ , or 123 men, 1st.

$\frac{735}{3627}$  of 182 men =  $36\frac{1188}{3627}$ , or 37 men, 2d.

$\frac{436}{3627}$  of 182 men =  $21\frac{1144}{3627}$ , or 22 men, 3d.

112.  $54 \text{ ft.} \div 4 = 13.5 \text{ ft.}$ , length of 1 side of base.

$\frac{13.5}{2} \text{ ft.} \times 100 = 675 \text{ sq. ft.}$ , area of 1 side.

$675 \text{ sq. ft.} \times 4 = 2700 \text{ sq. ft.}$ , area of 4 sides.

$2700 \text{ sq. ft.} = 300 \text{ sq. yd.}$ , Ans.

113.

$4^8 : 12^8 = 1 : x$ ; or  $64 : 1728 = 1 : x$   $\frac{1728 \times 1}{64} = 27$ , Ans.

### Article 414.

1. Four thousand two hundred thirty-eight minus seven hundred fifty-eight equals one hundred forty-five times twenty-four.

2.  $24 \times 325 = 7800$ ;  $36 \times 245 = 8820$ .

$8820 - 7800 = 1020$ , Ans.

3.  $192 \div 16 = 12$ ;  $64 \div 16 = 4$ ;  $12 - 4 = 8$ , Ans.

4.  $125 \times 9 = 1125$ , Ans.

5.  $20 - 12 = 8$  marbles;  $8 \div 2 = 4$  marbles, Ans.

6.  $\$50000 \div 12 = \$4166\frac{2}{3}$ , Ans.

7.  $730 - 365 = 365$ , Ans.

$$8. 16 \div 2 = 8 \text{ years; } \frac{8}{2} = 4 \text{ years, Ans.}$$

$$9. \frac{(12 \times 9) + 12}{5} = \frac{108 + 12}{5} = 24, \text{ Ans.}$$

$$10. 31 \times 24 \text{ h.} = 744 \text{ hours, Ans.}$$

### Article 415.

$$1. 42 \times 75 = 3150; 56700 \div 3150 = 18, \text{ Ans.}$$

$$2. 50000 - 360 = 49640$$

$$49640 \div 136 = 365, \text{ divisor, Ans.}$$

$$3. 149184 \div 84 = 1776, \text{ Ans.}$$

$$4. 32 \text{ mi.} + 36 \text{ mi.} = 68 \text{ mi.}$$

$$1224 \text{ mi.} \div 68 \text{ mi.} = 18 \text{ days, Ans.}$$

$$5. 26402 - 18725 = 7677, \text{ Ans.}$$

$$6. (1.) \text{ As many times as there are units in the multiplier.}$$

$$(2.) \text{ When the } \textit{multiplicand} \text{ is a concrete number.}$$

$$7. (1.) 40800 \times 30600 = 1248480000, \text{ Ans.}$$

$$(2.) \text{ Because the multiplicand is an abstract number.}$$

$$8. \$75 \times 8 = \$600, \text{ cost of 8 horses.}$$

$$\$125 \times 6 = \$750, \text{ " 6 horses.}$$

$$\$600 + \$750 = \$1350, \text{ whole cost.}$$

$$8 + 6 = 14, \text{ number of horses.}$$

$$\$120 \times 14 = \$1680, \text{ what they were sold for.}$$

$$\$1680 - \$1350 = \$330, \text{ gain, Ans.}$$

- $3102\frac{54}{123}$ , Ans.      *Proof.*  
 9. 123 ) 381600      3102, quotient.  
     369      123, divisor.  
     126      9306  
     123      6204  
     300      3102  
     246      381546  
     54      54, remainder.  
                     381600, dividend.
10.  $\$26 \times 240 = \$6240$ , cost.  
      $\$6240 - \$2820 = \$3420$ .  
          $3420 \div 180 = 19$  horses, Ans.

**Article 416.**

1. A figure is a character used to represent a number.  
A number is a unit or a collection of units.
2. (1.) Forty thousand ninety and forty-nine thousandths.  
(2.) An Integer.
3. By adding together the difference and subtrahend; the sum should equal the minuend.

832, minuend.	679, subtrahend.
679, subtrahend.	153, remainder.
153, remainder.	832, minuend.

4.      3008.7  
         299.99  
         8467  
         44  
         387.5  
         6  
         86784  
         87  
         99084.19, Ans.

5.  $3008.7 - 299.99 = 2708.71$ , Ans.

6.  $8467 + 44 = 8511$ , Ans.

7.	$\begin{array}{r} 387.5 \\ 6 \\ \hline 2325.0, \text{ Ans.} \end{array}$	$\begin{array}{r} 387.5 \\ 387.5 \\ 387.5 \\ 387.5 \\ 387.5 \\ 387.5 \\ \hline 2325.0, \text{ Ans.} \end{array}$
----	--	--

8.	$\begin{array}{r} 997\cancel{4}4, \text{ Ans.} \\ 87 \overline{) 86784} \\ \underline{783} \\ 848 \\ \underline{783} \\ 654 \\ \underline{609} \\ 45 \end{array}$	<i>Proof.</i> $\begin{array}{r} 997, \text{ quotient.} \\ 87, \text{ divisor.} \\ \hline 6979 \\ 7976 \\ \hline 86739 \\ 45 \\ \hline 86784, \text{ dividend.} \end{array}$
----	---	--

9.  $\$85 + \$165 = \$250$ , cost of cow and horse.

$\$276 - \$250 = \$26$ , Ans.

10.  $\$205 \times 108 = \$22140$ .

$22140 \div 75 = 295$  horses, and  $\$15$  remaining, Ans.

### Article 417.

1.	$\begin{array}{r} 87040 \\ 6080 \\ \hline 6963200 \\ 522240 \\ \hline 529203200, \text{ Ans.} \end{array}$
----	--

2.  $75 \times 128 \text{ cu. ft.} = 9600 \text{ cu. ft.}$ , Ans.

3.  $\$3 \times 45 = \$135$ , value of the apples.  
 $\$2 \times 65 = \$130$ , " " potatoes.  
 $\$135 + \$130 = \$265$ , amount of sale.  
 $\$6 \times 40 = \$240$ , value of the flour.

$$\$265 - \$240 = \$25, \text{ Ans.}$$

4.  $\$38.25 \div 17 = \$2.25$ , Ans.

5.  $84.61$ , multiplicand.  
 $27$ , multiplier.  
 $\begin{array}{r} 59227 \\ 16922 \\ \hline 2284.47 \end{array}$ , product, Ans.

6.  $\$0.16 \times 18 = \$2.88$ , value of the eggs.  
 $\$2.88 \div \$0.12 = 24 \text{ lb.}$ , Ans.

7.  $814 \times 16 = 13024$ ;  $13024 + 279 = 13303$ .  
 $13303 - 384 = 12919 \div 18 = 717\frac{1}{3}$ , Ans.

8.  $\begin{array}{r} 827 \\ 215 \\ \hline 4135 \\ 827 \\ \hline 1654 \\ \hline 177805 \end{array}$   $\begin{array}{r} 215 \\ 827 \\ \hline 1505 \\ 430 \\ \hline 1720 \\ \hline 177805 \end{array}$

9.  $\$6.50 \times 8 = \$52$ , cost of the wood.  
 $\$21 \times 18 = \$378$ , " " hay.  
 $\$0.90 \times 7 = \$6.30$ , " " potatoes.  
 $\$52 + \$378 + \$6.30 = \$436.30$ , whole cost.

$$\$436.30 - \$75 = \$361.30, \text{ Ans.}$$

10.  $\$1.50 \times 4 = \$6.00$ , cost of 4 books.  
 $\$1.80 \times 3 = \$5.40$ , " 3 "  
 $10 - (4 + 3) = 3$  books.  
 $\$0.28 \times 3 = \$0.84$ , cost of 3 books.  
 $\$6 + \$5.40 + \$0.84 = \$12.24$ , whole cost, Ans.

**Article 418.**

$$1. \frac{(125 + 36) \times (125 - 36)}{48} = \frac{161 \times 89}{48} = 298\frac{25}{48}, \text{ Ans.}$$

2.  $\$32400 + \$8400 = \$40800$ , what it was sold for.  
 $\$40800 \div 360 = \$113\frac{1}{3}$ , Ans.

$$3. \frac{1}{8} \text{ of } 69543248 = 8692906.$$

$$\frac{4}{9} \text{ of } 81369 = 36164.$$

$$8692906 - 36164 = 8656742, \text{ Ans.}$$

$$4. \frac{1}{5} \text{ of } 1265 \text{ books} = 253 \text{ books.}$$

$$\$0.50 \times 253 = \$126.50.$$

$$1265 \text{ books} - 253 \text{ books} = 1012 \text{ books.}$$

$$\$0.75 \times 1012 = \$759.$$

$$\$126.50 + \$759 = \$885.50, \text{ Ans.}$$

$$5. \$0.24 \times 18 = \$4.32, \text{ cost of steak.}$$

$$\$0.36 \times 4\frac{1}{2} = \$1.62, \text{ " eggs.}$$

$$\$0.18 \times 3 = \$0.54, \text{ " molasses.}$$

$$\$0.75, \text{ " potatoes.}$$

$$\underline{\$7.23}, \text{ Ans.}$$

6.  $40 \times 6 = 240$

$$35 \times 5 = 175$$

$$18 \times 4 = 72$$

$$240 + 175 + 72 + 115 = 602 \text{ people.}$$

$$602 - 62 = 540; \$0.25 \times 540 = \$135, \text{ Ans.}$$

7.  $\$1134.50 - \$55 = \$1079.50$ , cost of 254 sheep.

$$\$1079.50 \div 254 = \$4.25, \text{ cost of 1 sheep.}$$

$$\$4.25 \times 54 = \$229.50, \text{ cost of 54 sheep, Ans.}$$

8.  $\$1.00 = 20$  5-cent pieces.

$$\$720 = 720 \times 20 = 14400, \text{ Ans.}$$

9.  $\$45 \times 75 = \$3375$ , value of sewing-machines.

$$\$3375 + \$200 = \$3575, \text{ what was received.}$$

$$\$4278 - \$3575 = \$703, \text{ lost, Ans.}$$

10. 
$$\frac{6010 \times \overset{3010}{\cancel{6020}} \times \cancel{9}}{\underset{2}{\cancel{18}}} = 18090100, \text{ Ans.}$$

### Article 419.

1.  $1 + 2 + 3 + 5 + 7 + 11 + 13 + 17 + 19 + 23 + 29 + 31 + 37 = 198.$

$$4 + 6 + 8 + 9 + 10 + 12 + 14 + 15 + 16 + 18 + 20 + 21 + 22 + 24 + 25 + 26 + 27 + 28 + 30 + 32 + 33 + 34 + 35 + 36 + 38 + 39 + 40 = 622.$$

$$622 - 198 = 424, \text{ Ans.}$$

2. 9, 14, 25, Ans.

3.

$$\frac{6}{25} + \frac{5}{8} + \frac{3}{4} + \frac{2}{5} + \frac{7}{12} = \frac{144}{600} + \frac{375}{600} + \frac{450}{600} + \frac{240}{600} + \frac{350}{600} = \frac{1559}{600} = 2\frac{359}{600}, \text{ Ans.}$$

$$\begin{array}{l} 4. \quad 16) 96 = \frac{6}{7}; \quad 18) 126 = \frac{7}{11}; \quad 14) 182 = \frac{13}{14}; \\ 16) 112 = \frac{6}{7}; \quad 18) 198 = \frac{11}{11}; \quad 14) 196 = \frac{13}{14}; \\ 97) 873 = \frac{9}{11}. \quad \text{Ans. } \frac{6}{7}, \frac{7}{11}, \frac{13}{14}, \frac{9}{11}. \end{array}$$

5. (1.) A fractional unit is one of the equal parts into which a unit of a fraction is divided. (Art. 99.) Thus, one third is the fractional unit of thirds.

(2.) The unit of a fraction is the unit divided. Thus halves, thirds, are understood to be halves and thirds of 1.

$$6. \quad 4\frac{7}{13} + 6\frac{8}{13} + 12\frac{2}{13} = 4\frac{2}{13} + 6\frac{2}{13} + 12\frac{2}{13} = \frac{55}{13} + \frac{20}{13} + \frac{73}{13} = \frac{330}{78} + \frac{520}{78} + \frac{949}{78} = \frac{1799}{78}, \text{ or } 23\frac{7}{78}, \text{ Ans.}$$

$$7. \quad \begin{array}{l} (1.) \quad 175\frac{2}{3} = 175\frac{2}{3} = 174\frac{1}{3} \\ 95\frac{2}{3} = \frac{95\frac{1}{3}}{79\frac{1}{3}}, \text{ Ans.} \end{array}$$

$$\begin{array}{l} (2.) \quad 45\frac{2}{3} = 45\frac{2}{3} = 44\frac{1}{3} \\ 25\frac{2}{3} = \frac{25\frac{1}{3}}{19\frac{1}{3}}, \text{ Ans.} \end{array}$$

8. (1.) A fraction is multiplied by an integer either by multiplying its numerator or dividing its denominator by the integer.

(2.) Dividing the denominator when it can be done without a remainder.

(3.) Because it shortens the process.



9. (1.)  $175 \times 12 = 2100$

$$\frac{5}{7} \times 12 = \frac{84}{2108\frac{4}{7}}, \text{ Ans.}$$

(2.)  $124 \times 6 = 744$

$$124 \times \frac{3}{4} = \frac{93}{837}, \text{ Ans.}$$

$$(3.) 6\frac{3}{4} \times 12\frac{3}{4} = \frac{5}{8} \times \frac{17}{4} = 85, \text{ Ans.}$$

10.  $\frac{2}{5}$  of  $\frac{3}{\frac{4}{2}} = \frac{3}{10}$ , part of the ship sold, Ans.

$$\frac{3}{10} \text{ is valued at } \$30000.$$

$$\frac{10000}{\$30000} \times 10 = \$100000, \text{ value of ship, Ans.}$$

### Article 420.

1. (1.) A prime number is a number having no other factors than itself and one.

(2.) A composite number is a number having other factors than itself and one.

(3.) A fraction is one or more of the equal parts of a unit.

2.  $182 = 2 \times 7 \times 13$

$$196 = 2 \times 2 \times 7 \times 7$$

$$2 \times 7 = 14, \text{ greatest common divisor, Ans.}$$

$$\begin{aligned}
 3. \quad & 8 = 2 \times 2 \times 2 \\
 & 7 = 1 \times 7 \\
 & 10 = 2 \times 5 \\
 & 14 = 2 \times 7
 \end{aligned}$$

Ans.  $2^3 \times 5 \times 7 = 280$ , least common multiple. ✓

4.

$$13\frac{1}{4} = \frac{53}{4}$$

$$61\frac{1}{3} = \frac{553}{9}$$

$$15\frac{1}{3} = \frac{206}{13}$$

5.

$$75 \overline{) 225} = \frac{3}{5}; \quad 36 \overline{) 180} = \frac{5}{13}. \quad \text{Ans. } \frac{3}{5}, \frac{5}{13}$$

$$6. \quad \frac{1295}{35} = 37$$

$$\frac{2170}{17} = 127\frac{1}{17}$$

$$\frac{1000}{73} = 13\frac{1}{73}$$

$$\frac{8}{9} \times 4 = \frac{32}{36}$$

$$\frac{6}{8} \times \frac{3}{4} \times 9 = \frac{27}{36}$$

$$\frac{5}{12} \times 3 = \frac{15}{36}$$

$$\frac{2}{3} \times 12 = \frac{24}{36}$$

$$\text{Ans. } \frac{32}{36}, \frac{27}{36}, \frac{15}{36}, \frac{24}{36}.$$

8. When required to add or subtract them.

$$9. \quad 48\frac{3}{10} \quad \frac{12}{32} = \frac{3}{8}$$

$$56\frac{1}{2}$$

$$40\frac{1}{2}$$

$$45\frac{1}{10}$$

$$2\frac{1}{10}$$

$$191\frac{1}{10}, \text{ Ans.}$$

$$\frac{3}{10} + \frac{3}{4} + \frac{3}{8} + \frac{27}{40} = \frac{12}{40} + \frac{30}{40} + \frac{15}{40} + \frac{27}{40} =$$

$$\frac{84}{40} = 2\frac{1}{10}$$

10.

$$5\frac{1}{2} + 6\frac{1}{2} = 12\frac{1}{2}; \quad 25\frac{3}{4} \text{ bu.} - 12\frac{1}{2} \text{ bu.} = 13\frac{1}{4} \text{ bu., Ans.}$$

**Article 421.**

1.

$$\begin{aligned} 36 &= 2 \times 2 \times 3 \times 3 \\ 108 &= 2 \times 2 \times 3 \times 3 \times 3 \\ 420 &= 2 \times 2 \times 3 \times 5 \times 7 \end{aligned}$$

$$2^2 \times 3 = 12, \text{ greatest common divisor, Ans.}$$

2.

$$\begin{aligned} 24 &= 2 \times 2 \times 2 \times 3 \\ 180 &= 2 \times 2 \times 3 \times 3 \times 5 \\ 45 &= 3 \times 3 \times 5 \\ 60 &= 2 \times 2 \times 3 \times 5 \end{aligned}$$

$$2^3 \times 3^2 \times 5 = 360, \text{ least common multiple, Ans.}$$

3.  $12\frac{3}{4}$ 

$$\begin{array}{r} 16\frac{3}{4} \\ 24\frac{1}{2} \end{array} \quad \frac{3}{4} + \frac{2}{3} + \frac{4}{5} + \frac{7}{8} =$$

$$\begin{array}{r} 40\frac{7}{8} \\ 92 \end{array} \quad \frac{90}{120} + \frac{80}{120} + \frac{96}{120} + \frac{105}{120} = \frac{371}{120} = 3\frac{111}{120}$$

$$\begin{array}{r} 3\frac{111}{120} \\ 95\frac{111}{120}, \text{ Ans.} \end{array}$$

4.

$$\begin{aligned} 84\frac{1}{3} &= 84\frac{8}{24} = 83\frac{32}{24} \\ 42\frac{7}{8} &= \frac{42\frac{21}{24}}{41\frac{11}{24}}, \text{ Ans.} \end{aligned}$$

$$\begin{array}{r} 91 \\ 5 \end{array} \quad \begin{array}{r} 2 \\ 3 \end{array} \text{ of } 12\frac{3}{4} \times 36\frac{3}{4} = \frac{2}{3} \text{ of } \frac{101}{8} \times \frac{182}{5} = \frac{9191}{30} = 306\frac{11}{30}, \text{ Ans.}$$

$$6. \quad 27\frac{3}{4} = \frac{111}{4}; \quad \frac{2}{3} \text{ of } 8\frac{1}{2} = \frac{2}{3} \text{ of } \frac{17}{2} = \frac{17}{3}.$$

$$\frac{111}{4} \div \frac{17}{3} = \frac{111}{4} \times \frac{3}{17} = \frac{333}{68} = 4\frac{51}{68}, \text{ Ans.}$$

$$7. \quad \frac{\frac{7}{12}}{\frac{5}{8}} = \frac{7}{12} \times \frac{8}{5} = \frac{14}{15}, \text{ Ans.} \quad \frac{6\frac{2}{3}}{9\frac{2}{3}} = \frac{27}{4} \times \frac{3}{29} = \frac{81}{116}, \text{ Ans.}$$

$$8. \quad \frac{\$7000}{2} \times 3 = \$10500, \text{ value of the farm.}$$

$$\frac{5}{8} \text{ of } \$10500 = \$6562\frac{1}{2}, \text{ Ans.}$$

$$9. \quad 240 \div 5\frac{1}{4} = 240 \times \frac{4}{23} = \frac{960}{23} \text{ mi., what he travels in 1 d.}$$

$$\frac{960}{23} \times 3\frac{1}{2} = \frac{960}{23} \times \frac{7}{2} = \frac{3360}{23} = 146\frac{2}{23} \text{ mi., Ans.}$$

$$10. \quad \frac{\$120}{3} \times 7 = \$280, \text{ value of the coal.}$$

$$\$280 \div \$6 = 46\frac{2}{3} \text{ tons, Ans.}$$

### Article 422.

1. (1.) Factoring is the process of finding the factors of composite numbers.

(2.) The terms of a fraction are its *denominator*, which shows into how many equal parts the unit is divided; and its *numerator*, which shows how many of the equal parts of the unit are taken.

2. Two or more numbers are said to be prime to each other when they have no common factor.

$$3. \frac{\overset{5}{\cancel{800}} \times \overset{6}{\cancel{378}} \times \overset{11}{\cancel{44}} \times 15}{\cancel{160} \times \cancel{63} \times \cancel{11} \times 4} = 450, \text{ Ans.}$$

$$4. 135 \div 9 = 15; \quad \frac{4 \times 15}{9 \times 15} = \frac{60}{135}, \text{ Ans.} \quad \swarrow$$

$$5. 36\frac{2}{3} = 36\frac{2}{3} = 35\frac{2}{3} \\ 15\frac{2}{3} = \frac{15\frac{2}{3}}{20\frac{1}{3}}, \text{ Ans.}$$

$$6. \frac{3}{4} \text{ of } 17 = \frac{51}{4}; \quad 12\frac{1}{2} \div \frac{51}{4} = \frac{112}{9} \times \frac{4}{51} = \frac{448}{459}, \text{ Ans.}$$

7.

$$\frac{2}{3} \text{ of } \frac{5}{7} = \frac{10}{21}; \quad \frac{10}{21} = \$45000; \quad \frac{\$45000}{10} \times 21 = \$94500, \text{ Ans.}$$

$$8. \frac{\overset{800}{\cancel{4000}}}{\cancel{5}} \times 8 = \$6400, \text{ value of the farm.} \\ \frac{3}{4} \text{ of } \$6400 = \$4800, \text{ Ans.}$$

$$9. \frac{\frac{7}{8} \times \frac{2}{3} = \frac{14}{24}}{4\frac{1}{2} \div \frac{1}{3} = \frac{9}{2}} = \frac{14}{27} = \frac{\cancel{14}}{\cancel{24}} \times \frac{2}{27} = \frac{7}{162}, \text{ Ans.} \\ \frac{12}{6}$$

$$10. 1 = \frac{247832}{247832}; \quad \frac{247832}{247832} \div \frac{3}{247832} = 82610\frac{2}{3}; \quad \frac{3}{247832} \text{ is}$$

a small fraction, since it takes  $82610\frac{2}{3}$  times this fraction to equal one.

**Article 423.**

$$1. \begin{array}{l} 1001 \overline{) 3003} = \frac{3}{5}; \quad 29 \overline{) 87} = \frac{3}{5}; \quad 143 \overline{) 429} = \frac{3}{5}. \\ 1001 \overline{) 5005} = \frac{5}{5}; \quad 29 \overline{) 145} = \frac{5}{5}; \quad 143 \overline{) 715} = \frac{5}{5}. \end{array}$$

$$2. 4\frac{1}{21} + 3\frac{1}{4} + 4\frac{3}{8} + \frac{1}{7} = 11 + \frac{4}{84} + \frac{147}{84} + \frac{224}{84} + \frac{72}{84} = \\ 11\frac{447}{84} = 11 + 5\frac{2}{8} = 16\frac{2}{8}, \text{ Ans.}$$

$$3. \begin{array}{l} 31\frac{1}{2} = 31\frac{2}{4} = 30\frac{3}{2} \\ 12\frac{3}{4} = \frac{123}{4} \\ \hline 18\frac{3}{2}, \text{ Ans.} \end{array} \quad \begin{array}{l} 4. \$4283\frac{1}{2} = \$4282\frac{1}{2} \\ \$1597\frac{3}{4} = \$1597\frac{3}{4} \\ \hline \$2685\frac{1}{2}, \text{ Ans.} \end{array}$$

$$5. \begin{array}{l} 641 \times 5 = 3205 \\ 641 \times \frac{5}{2} = \frac{2405}{2} \\ \hline 3445\frac{1}{2}, \text{ Ans.} \end{array}$$

$$6. \frac{1}{17} \text{ of } 3\frac{1}{2} \text{ of } 4\frac{1}{2} \text{ of } 63\frac{3}{4} \text{ of } 3\frac{1}{2} = \frac{1}{17} \text{ of } \frac{22}{7} \text{ of } \frac{17}{4} \text{ of } \frac{191}{3} \text{ of } \frac{21}{28} \\ = \frac{2101}{56}, \text{ Ans.}$$

$$7. \frac{8\frac{2}{3}}{9\frac{1}{2}} = \frac{42}{5} \times \frac{4}{39} = \frac{56}{65}; \quad \frac{56}{65} + 7\frac{1}{2} = \frac{112}{130} + 7\frac{65}{130} = 8\frac{47}{130}, \text{ Ans.}$$

$$8. \$2\frac{1}{4} \div 3\frac{1}{2} = \$\frac{9}{4} \times \frac{2}{7} = \$\frac{9}{14}, \text{ cost of 1 lb.}$$

$$\frac{3}{4} \text{ of } \$\frac{9}{14} = \$\frac{27}{56}, \text{ cost of } \frac{3}{4} \text{ lb., Ans.}$$

$$9. 2\frac{1}{10} \div 5\frac{7}{11} = \frac{21}{10} \times \frac{11}{62} = \frac{231}{620}, \text{ Ans.}$$

10.  $10\frac{3}{4} \times 3 = 32\frac{1}{4}$  miles in 1 hour's flight.

$$2\frac{1}{2} \times 32\frac{1}{4} = \frac{5}{2} \times \frac{129}{4} = \frac{645}{8} = 80\frac{5}{8} \text{ miles, Ans.}$$

### Article 424.

1.  $20\frac{7}{12} = 20\frac{70}{120}$ ;  $12\frac{13}{10} = 12\frac{39}{30}$ .

$$20\frac{70}{120} + 12\frac{39}{30} = 32\frac{109}{120}, \text{ sum, Ans.}$$

$$20\frac{70}{120} - 12\frac{39}{30} = 8\frac{31}{120}, \text{ difference, Ans.}$$

2. (1.) A fraction can be divided by a whole number either by dividing its numerator or multiplying its denominator.

(2.) Dividing the numerator is preferable when it can be done without a remainder, since it shortens the process.

$$3. \quad 32\frac{1}{2} \times 5\frac{1}{2} = \frac{164}{5} \times \frac{10}{7} = \frac{1312}{7} = 187\frac{3}{7} \text{ miles, Ans.}$$

$$4. \quad \$84\frac{2}{3} \div 18\frac{2}{3} = \frac{763}{9} \times \frac{4}{75} = \frac{3052}{675} = \$4\frac{348}{675}, \text{ Ans.}$$

$$5. \quad \frac{3}{4} - \frac{5}{7} = \frac{21}{28} - \frac{20}{28} = \frac{1}{28}$$

$$\frac{1}{28} = \$500; \quad \frac{28}{28} = 28 \times \$500 = \$14000, \text{ Ans.}$$

6.  $\frac{1}{3}$  of  $\frac{5}{8} = \frac{5}{24}$ , the part sold.

$$\frac{5}{24} = \$12000; \quad \frac{\$2400}{5} \times 24 = \$57600, \text{ Ans.}$$

$$7 \quad \frac{2}{3} \text{ of } \$12000 + \$600 = \$9000 + \$600 = \$9600.$$

$$\$9600 = \frac{2}{3} \text{ of B's money.}$$

$$\frac{\$9600}{\frac{2}{3}} \times 5 = \$12000, \text{ B's money, Ans.}$$

$$8. \quad \frac{4\frac{3}{4} + 3\frac{1}{2}}{8\frac{3}{4} \times 2\frac{5}{8}} = \frac{\frac{14}{3} + \frac{7}{2}}{\frac{35}{4} \times \frac{17}{6}} = \frac{\frac{49}{6}}{\frac{595}{24}} = \frac{49}{\cancel{6}} \times \frac{\cancel{24}^4}{595} = \frac{196}{595}, \text{ Ans.}$$

$$9. \quad 100 \text{ acres} - 37\frac{1}{2} \text{ acres} = 62\frac{1}{2} \text{ acres.}$$

$$\frac{1}{5} \text{ of } 62\frac{1}{2} \text{ acres} = \frac{1}{5} \text{ of } \frac{125}{2} = 12\frac{1}{2} \text{ acres.}$$

$$62\frac{1}{2} \text{ acres} - 12\frac{1}{2} \text{ acres} = 50 \text{ acres, Ans.}$$

$$10. \quad \frac{1}{2} \text{ of } \frac{2}{3} \text{ of } \frac{7}{8} = \frac{7}{24}, \text{ what he sold.}$$

$$\frac{7}{24} = \$32000. \quad \frac{\$32000}{\frac{7}{24}} \times 24 = \$109714\frac{2}{3}, \text{ Ans.}$$

### Article 425.

$$1. \quad 46\frac{2}{3}$$

$$49\frac{7}{8}$$

$$\frac{57\frac{1}{4}}{152} \quad \frac{5}{8} + \frac{7}{16} + \frac{1}{4} = \frac{10}{16} + \frac{7}{16} + \frac{4}{16} = \frac{21}{16} = 1\frac{5}{16}$$

$$\frac{1\frac{5}{16}}{153\frac{5}{16}}, \text{ Ans.}$$

$$2. \quad 65\frac{2}{3} + 28\frac{4}{5} = 65\frac{2}{3} + 28\frac{4}{5} = 94\frac{1}{3}, \text{ Ans.}$$

$$3. \quad 56 - 24\frac{7}{10} = 31\frac{3}{10}; \quad 41\frac{1}{3} + 31\frac{3}{10} = 73\frac{1}{6}$$

$$73\frac{1}{6} - 41\frac{1}{3} = 31\frac{1}{6}, \text{ Ans.}$$



$$4. \frac{4}{5} \text{ of } 156\frac{3}{4} \times \frac{5}{6} \text{ of } \$54 = \frac{4}{\cancel{5}} \text{ of } \frac{470}{\cancel{5}} \times \frac{\cancel{5}}{\cancel{6}} \text{ of } \$\frac{\cancel{54}^9}{\cancel{4}} =$$

$$\$5640, \text{ Ans.}$$

$$5. 297\frac{1}{2} \div 33\frac{1}{2} = \frac{595}{2} \times \frac{3}{\cancel{200}^6} = \frac{255}{29} = 8\frac{1}{29}, \text{ Ans.}$$

$$6. 2\frac{1}{4} \div \frac{3}{8} = \frac{9}{4} \times \frac{8}{3} = 6 \text{ lots, Ans.}$$

$$7. \frac{\frac{3}{8} \times \frac{11}{21}}{\frac{1}{18} \times 5\frac{1}{2}} = \frac{\frac{33}{168}}{\frac{11}{36}} = \frac{\cancel{33}^3}{\cancel{168}^{14}} \times \frac{\cancel{36}^3}{\cancel{11}} = \frac{9}{14}, \text{ Ans.}$$

$$8. \frac{3}{4} \text{ of } 8 \text{ mi.} = 6 \text{ mi.}$$

$$6 \text{ mi.} = \frac{6}{9} \text{ of } 9 \text{ mi.} = \frac{6}{9}, \text{ or } \frac{2}{3}, \text{ Ans.}$$

$$9. \frac{\$9000}{2} \times 3 = \$13500, \text{ value of the farm.}$$

$$\frac{5}{12} \text{ of } \$13500 = \$5625, \text{ Ans.}$$

$$10. \frac{5}{3} + 2 = \frac{7}{3}; \frac{5}{3} - \frac{7}{5} = \frac{25}{15} - \frac{21}{15} = \frac{4}{15}, \text{ diminished, Ans.}$$

### Article 426.

$$1. 7\frac{1}{2} - 3\frac{1}{2} = 4; 3\frac{1}{2} \div 14\frac{1}{2} = \frac{\cancel{13}^9}{40} \times \frac{9}{\cancel{13}^9} = \frac{9}{40}, \text{ Ans.}$$

$$2. \frac{1}{3} \text{ of a day's work can be had for } \$1; \text{ for } \$2\frac{1}{2} \text{ can be had}$$

$$2\frac{1}{2} \times \frac{1}{3} = \frac{2\frac{1}{2}}{3} = \frac{5}{2} \times \frac{1}{3} = \frac{5}{6} \text{ day, Ans.}$$

$$3. 94 \times 26\frac{2}{3} = 2506\frac{2}{3}; \quad 12000 \div 7\frac{1}{2} = 1548\frac{1}{2}$$

$$2506\frac{2}{3} - 1548\frac{1}{2} = 958\frac{2}{3}, \text{ Ans.}$$

$$4. \frac{4}{63} + \frac{3}{84} = \frac{16}{252} + \frac{9}{252} = \frac{25}{252}, \text{ Ans.}$$

5.

$$\frac{1}{2} \text{ of } \frac{3}{7} = \frac{3}{14}; \quad \frac{7}{8} \times 3\frac{1}{2} = \frac{14}{5}; \quad \frac{14}{5} + \frac{3}{14} = \frac{211}{70}, \text{ denominator.}$$

$$\frac{2}{3} \text{ of } \frac{211}{70} = \frac{211}{105}, \text{ numerator.} \quad \frac{211}{105} \div \frac{211}{70} = \frac{2}{3}, \text{ Ans.}$$

The value of any fraction whose numerator is  $\frac{2}{3}$  of its denominator is  $\frac{2}{3}$ . The solution is unnecessary.

$$6. 6\frac{2}{3} \times 2\frac{5}{8} = \frac{20}{3} \times \frac{21}{8} = \frac{35}{2}; \quad 5\frac{1}{3} \div 3\frac{2}{3} = \frac{16}{3} \times \frac{4}{15} = \frac{64}{45}$$

$$\frac{35}{2} + \frac{64}{45} = \frac{1575}{90} + \frac{128}{90} = 18\frac{8}{9}, \text{ sum.}$$

$$\frac{35}{2} - \frac{64}{45} = \frac{1575}{90} - \frac{128}{90} = 16\frac{7}{9}, \text{ difference.}$$

$$18\frac{8}{9} + 16\frac{7}{9} = 35, \text{ Ans.}$$

$$7. \$2\frac{1}{2} = \frac{5}{2} \div \frac{3}{5} = \frac{25}{6} = \$4\frac{1}{6}, \text{ cost.}$$

$$\$4\frac{1}{6} - \$2\frac{1}{2} = \$1\frac{1}{3}, \text{ loss, Ans.}$$

$$8. \frac{1}{5} \text{ of } 2 \text{ qt., or } \frac{2}{5} \text{ qt.,} + \frac{1}{3} \text{ qt.} = \frac{11}{15} \text{ qt.}$$

$$2 \text{ qt.} - \frac{11}{15} \text{ qt.} = 1\frac{4}{15} \text{ qt., remainder.}$$

$$1\frac{4}{15} \text{ qt.} = \frac{19}{15} \div 3 = \frac{19}{45} \text{ qt., Ans.}$$

9. (1.)  $24\frac{3}{4} = \frac{99}{4} \times \frac{7}{8} = \frac{693}{32} = 21\frac{31}{32}$ , Ans.

(2.)  $24\frac{3}{4} = \frac{99}{4} \div \frac{7}{8} = \frac{99}{4} \times \frac{8}{7} = \frac{198}{7} = 28\frac{2}{7}$ , Ans.

(3.)  $23\frac{3}{4} - 21\frac{31}{32} = 6\frac{141}{32}$ , Ans.

10.  $\frac{\$1760}{3} \times 8 = \frac{14080}{3} = \$4693\frac{1}{3}$ , value of farm.

$\frac{8}{8} - \frac{3}{8} = \frac{5}{8}$ ;  $\frac{1}{2}$  of  $\frac{5}{8} = \frac{5}{16}$ , B's share.

$\frac{5}{8} - \frac{5}{16} = \frac{5}{16}$ , C's share.

$\frac{5}{16}$  of  $\$4693\frac{1}{3}$ , or  $\$1466\frac{2}{3} + \$375 = \$1841\frac{2}{3}$ , Ans.

### Article 427.

1.  $\frac{9}{48} = \frac{9.0000}{48} = .1875$ , Ans.

2.  $\begin{array}{r} .800 \\ .00008 \\ \hline .79992 \end{array}$ , Ans.

3. Seven and eight thousandths. Nine thousand ninety and nine hundred nine thousandths. Forty-two hundred-thousandths.

4.  $0.0025 = \frac{25}{10000} = \frac{1}{400}$ , Ans.

5. The denominator of a decimal is not expressed, since it is always 1 with as many ciphers as there are decimal figures.

6.  $49\frac{3}{4} = 49.875$ ;  $\frac{1}{2} = .5$ ;  $3\frac{1}{4} = 3.75$

$.5 + 3.75 + 21.125 = 25.375$  yd., what was sold.

$49.875$  yd.  $- 25.375$  yd.  $= 24.5$  yd., Ans.

$$7. \frac{3}{8} = .375$$

$$\frac{4}{5} = .8$$

$$\frac{5}{16} = .3125$$

$$\frac{9}{75} = .12$$

$$\underline{1.6075}, \text{ Ans.}$$

$$8. \$1.37\frac{1}{2} \times 240 = \$330, \text{ Ans.}$$

$$9. \$12.56 \div 4 = \$3.14, \text{ cost of 1 bu.}$$

$$\$3.14 \times 9 = \$28.26, \text{ Ans.}$$

$$10. .024 \div .0025 = 9.6$$

$$.016 \times 300 = 4.8$$

$$4.8 \div 9.6 = .5, \text{ Ans.}$$

### Article 428.

$$1. \frac{73}{8000} = 73 \div 8000 = .009125, \text{ Ans.}$$

$$2. .00960 = \frac{960}{100000} = \frac{6}{625}, \text{ Ans.}$$

$$3. 144 \div 12000 = .012; .0144 \div .00012 = 120$$

$$.012 \times 120 = 1.44, \text{ Ans.}$$

$$4. .02 \text{ of } .006 = .00012$$

$$.00012 - .0000023 = .0001177, \text{ Ans.}$$

$$5. 17.28 \div .083\frac{1}{3} = 207.36, \text{ Ans.}$$

$$6. .027\frac{1}{2} = .0275; .36\frac{3}{4} = .3675$$

$$.0275 \times .3675 = .01010625, \text{ Ans.}$$

$$7. \frac{7\frac{1}{2}}{6000} = \frac{15}{2} \times \frac{1}{\cancel{6000}_{400}} = \frac{1}{800} = .00125, \text{ Ans.}$$

8. (1.) By moving the decimal point three orders to the left.  
 (2.) By moving the decimal point two orders to the right.

$$9. 90 \div .03 = 3000, \text{ the number; } 3000 \times .005 = 15, \text{ Ans.}$$

$$10. 1.2 \div .0025 = 480; 480 - .0025 = 479.9975, \text{ Ans.}$$

**Article 429.**

1.  $\frac{3}{40} = .075, \times .0008 = .00006; .00006 \div .02 = .003, \text{Ans.}$

2.  $1000 \div .001 = 1000000$

$1000 \times .001 = 1, \text{product of dividend and divisor.}$

$1 + 1000 + .001 = 1001.001$

$1000000 - 1001.001 = 998998.999, \text{Ans.}$

3.

$.600 \times .00006 = .000036; .000036 \div .02\frac{1}{2} = .00144, \text{Ans.}$

4.  $\$1 + \$2\frac{1}{2} + \$3 + \$5 + \$10 + \$20 = \$41.50$

$\$41.50 \div \$0.25 = 166, \text{Ans.}$

5.  $15280 \text{ bricks} = 15.280 \text{ M.}; 15.280 \times \$40 = \$611.20, \text{cost.}$

$350 = .350 \text{ M., worthless}; 15.280 - .350 = 14.93$

$\$611.20 \div 14.93 = \$40.93\frac{1}{3}, \text{Ans.}$

6.  $\$1500 - \$968 = \$532, \text{what he saves in 1 year.}$

$\$3724 \div \$532 = 7 \text{ years, Ans.}$

7.  $1 - 0.60 = 0.40, \text{what he had left.}$

$.83\frac{1}{3} - .40 = .43\frac{1}{3}; \$130 = .43\frac{1}{3}$

$\frac{\$130}{.43\frac{1}{3}} \times 100 = \$300, \text{Ans.}$

8.  $19375 \text{ ft.} = 19.375 \text{ thousand ft.}$

$\$17.25 \times 19.375 = \$334.21\frac{1}{2}, \text{Ans.}$

9.  $21\frac{1}{2} \text{ yd. carpeting @ } \$1.75 \text{ . . . . } \$38.06\frac{1}{2}$

$25 \text{ " lining " } 0.12\frac{1}{2} \text{ . . . . } 3.12\frac{1}{2}$

$2\frac{7}{8} \text{ " silk " } 2.25 \text{ . . . . } 6.46\frac{7}{8}$

$\frac{3}{4} \text{ " velvet " } 2.87\frac{1}{2} \text{ . . . . } 2.15\frac{3}{4}$

$\$49.81\frac{1}{2}, \text{Ans.}$

10.  $\$11 \div 4400 = \$0.0025$ , cost of 1 ft.

$\frac{1}{2}$  of  $\$0.0025 = \$0.0006\frac{1}{2}$ .

$\$0.0025 + \$0.0006\frac{1}{2} = \$0.0031\frac{1}{2}$ .

$4400 \text{ ft.} - 1500 \text{ ft.} = 2900 \text{ ft.}$

$\$0.0031\frac{1}{2} \times 2900 = \$9.06\frac{1}{2}$ , Ans.

### Article 430.

1.  $25\frac{5}{8} = 25.3125$ ;  $25.3125 - 15.064 = 10.2485$ , Ans.

2. (1.) A complex fraction is a fraction having a fraction in one or both of its terms. (Art. 133.)

(2.) A mixed decimal is an integer and a decimal. (Art. 139.)

(3.) A denominate number is a number composed of units of one or more denominations. (Art. 184.)

(4.) Reduction is changing denominate numbers from one denomination to another without changing their value.

3. (1.)  $\frac{16}{22} = 16.00000 \div 22 = 0.72727\frac{3}{11}$ , Ans.

(2.)  $0.0875 = \frac{875}{10000} = \frac{7}{80}$ , Ans.

4.  $1 \text{ ft.} \div 3 = \frac{1}{3} \text{ yd.}; 2\frac{1}{3} \text{ yd., or } \frac{7}{3} \text{ yd.,} \div 5\frac{1}{2} = \frac{14}{33} \text{ rd.}$

$65\frac{1}{3} \text{ rd., or } \frac{2159}{33}, \div 320 = \frac{2159}{10560} = 0.20445\frac{1}{2} \text{ mile, Ans.}$

5.  $0.5473 \text{ lb.} = .5473 \text{ of } 12 \text{ oz.} = 6.5676 \text{ oz.}$

$.5676 \text{ oz.} = .5676 \text{ of } 20 \text{ pwt.} = 11.352 \text{ pwt.}$

$.352 \text{ pwt.} = .352 \text{ of } 24 \text{ gr.} = 8.448 \text{ gr.}$

Ans. 6 oz. 11 pwt. 8.448 gr.

6.  $80 \times 12 \times 4 = 3840 \text{ cu. ft.}; 3840 \text{ cu. ft.} \div 128 = 30 \text{ cd.}$

$\$5.50 \times 30 = \$165$ , Ans.

7.  $45 \text{ sq. rd.} \div 160 = \frac{9}{32} \text{ A.}; \quad 260 \text{ A.} + \frac{9}{32} \text{ A.} = 260\frac{9}{32} \text{ A.}$

$\$25.75 \times 260\frac{9}{32} = \$6702.24\frac{3}{32}, \text{ Ans.}$

8. 1 metric ton = 1000 kilograms.

$16.455 \times 1000 = 16455 \text{ kilograms, Ans.}$

9. 5 oz., or  $\frac{5}{16} \text{ lb.}, + 6 \text{ lb.} = 6\frac{5}{16} \text{ lb.}$

$\$0.32 \times 6\frac{5}{16} = \$2.02, \text{ cost of coffee.}$

$\$3.46 - \$2.02 = \$1.44, \text{ cost of sugar.}$

$\$1.44 \div \$0.11 = 13\frac{1}{11} \text{ lb., or } 13 \text{ lb. } 1\frac{1}{11} \text{ oz., Ans.}$

10. 1 degree =  $69\frac{37}{100}$  miles =  $\frac{62137}{900}$  miles.

$\frac{62137}{900} \times 90 = \frac{62137}{10} = 6213.7 \text{ miles in quadrant.}$

1 mile = 63360 inches.

$6213.7 \times 63360 = 393700032 \text{ inches.}$

$393700032 \div 10000000 = 39.37+ \text{ inches, Ans.}$

### Article 431

1. Oct. 11, 1492, to Oct. 11, 1775, = 283 y.

Oct. 11, 1775, to June 11, 1776, = 8 mo.

June 11, 1776, to July 4, 1776, = 23 d.

Oct. 11, 1492, to July 4, 1776, = 283 y. 8 mo. 23 d., Ans

2. 104 A. 117 sq. rd.

$\begin{array}{r} 87 \quad 78 \\ \hline \end{array}$

192 A. 35 sq. rd., area of both farms.

$\begin{array}{r} 40 \quad 40 \\ \hline \end{array}$

3) 151 A. 155 sq. rd., remainder.

50 A. 105 sq. rd., Ans.

$$3. \quad 40 \text{ min.} = \frac{40}{60} = \frac{2}{3} \text{ h.}$$

$$24 \div \frac{2}{3} = 36$$

$$16 \text{ mi. } 25 \text{ rd. } 12 \text{ ft.}$$

$$36$$

$$578 \text{ mi. } 286 \text{ rd. } 3 \text{ ft., Ans.}$$

$$4. \quad 5 \text{ h. } 55 \text{ min.}$$

$$\frac{15}{88^\circ 45', \text{ Ans.}}$$

$$6. \quad 2^\circ \quad 30' \quad 20''$$

$$71^\circ \quad 0' \quad 0''$$

$$5$$

$$12 \quad 31 \quad 40$$

$$12^\circ \quad 31' \quad 40''$$

$$\text{Ans. } 58^\circ \quad 28' \quad 20'', \text{ West.}$$

7. (1.) A square is a rectangle with equal sides.

(2.) A rectangle is a plane surface with four straight sides and four right angles.

(3.) A cube is a solid bounded by six equal squares. (Art. 170.)

(4.) A solid is that which has length, breadth, and thickness. (Art. 169.)

8. The year 1880 = 366 days. The year 1881 = 365 days.

$$365 + 366 = 731 \text{ days. } 4 \text{ min.} \times 731 = 2924 \text{ min.}$$

$$2924 \text{ min.} = 2 \text{ d. } 0 \text{ h. } 44 \text{ min., Ans.}$$

9.  $32 \text{ ft.} \times 3.1416 = 100.5312 \text{ ft., circumference of field.}$

$$100.5312 \text{ ft.} \div 4 = 25.1328 \text{ ft., on 1 side of square.}$$

$$25.1328^2 = 631.65763584 \text{ sq. ft., area of square field.}$$

$$631.65763 + \text{sq. ft.} = 2.32 + \text{sq. rd., Ans.}$$

10.  $24 \text{ ft. } 6 \text{ in.} = 2\frac{1}{2} \text{ ft.; } 20 \text{ ft. } 9 \text{ in.} = 2\frac{3}{4} \text{ ft.; } 8 \text{ in.} = \frac{2}{3} \text{ ft.}$

$$\frac{49}{2} \times \frac{83}{4} \times \frac{2}{3} = \frac{4067}{12} = 338\frac{11}{12} \text{ cu. ft.}$$

$$\frac{11}{12} \times 1728 = 1584 \text{ cu. in.}$$

$$\text{Ans. } 338 \text{ cu. ft. } 1584 \text{ cu. in.}$$



**Article 432.**

1.  $(14 \text{ ft.} + 16 \text{ ft.}) \times 2 = 60 \text{ ft.}$

$60 \times 8 = 480 \text{ sq. ft., surface of walls.}$

$\frac{8}{8} - \frac{1}{8} = \frac{7}{8}; \frac{7}{8} \text{ of } 480 \text{ sq. ft.} = 420 \text{ sq. ft.}$

$420 \div 1\frac{1}{2} = 280 \text{ ft., length of paper.}$

$280 \text{ ft.} = 93\frac{1}{3} \text{ yd.}$

$93\frac{1}{3} \text{ yd.} \div 8 \text{ yd.} = 11\frac{2}{3} \text{ rolls, Ans.}$

2.  $\frac{4}{5} \text{ of } 29\frac{1}{3} = \frac{4}{5} \text{ of } \frac{88}{3} = \frac{352}{15}; 2\frac{7}{8} = \frac{23}{8} \times \frac{\overset{44}{\cancel{352}}}{15} = \frac{1012}{15}$

$\frac{3}{11} \text{ of } 8 = \frac{24}{11}; 4\frac{4}{8} = \frac{29}{8} \times \frac{\overset{4}{\cancel{24}}}{11} = \frac{116}{11}$

$\frac{1012}{15} \div \frac{116}{11} = \frac{\overset{253}{\cancel{1012}}}{15} \times \frac{11}{\underset{29}{\cancel{116}}} = \frac{2783}{435} = 6\frac{173}{135}, \text{ Ans.}$

3.  $\frac{3}{5} \times 12 = \frac{36}{5} = 7\frac{1}{5} \text{ gross}; \frac{1}{5} \times 12 = \frac{12}{5} = 2\frac{2}{5} \text{ dozen.}$

**Ans. 7 gross,  $2\frac{2}{5}$  dozen.**

**4.**

$8 \times 4 \times 2 = 64 \text{ sq. in.}; 8 \times 2 \times 2 = 32 \text{ sq. in.}$

$4 \times 2 \times 2 = 16 \text{ sq. in.}$

$64 \text{ sq. in.} + 32 \text{ sq. in.} + 16 \text{ sq. in.} = 112 \text{ sq. in., surface of 1 brick.}$

$112 \text{ sq. in.} \times 15 = 1680 \text{ sq. in., Ans.}$

5.  $\text{May } 7 + 275 \text{ d.} = 24 + 30 + 31 + 31 + 30 + 31 + 30 + 31 + 31 + 6 = 275 \text{ d.} = \text{Feb. 6, Ans.}$

$$6. 1 \text{ pt.} \div 2 = \frac{1}{2} \text{ qt.}; \quad 3\frac{1}{2} \text{ qt.} = \frac{7}{2} \div 4 = \frac{7}{8} \text{ gal.}$$

$$17 \text{ gal.} + \frac{7}{8} = 17\frac{7}{8} \text{ gal.} \quad \$0.45 \times 17\frac{7}{8} = \$8.04\frac{3}{8}, \text{ Ans.}$$

$$7. \frac{3.75 \times 48.34\frac{1}{2}}{.5\frac{1}{8}} = \frac{181.29375}{.5125} = 353.71\frac{1}{8}, \text{ Ans.}$$

$$8. 1 \text{ mile} = 5280 \text{ ft.}; \quad \frac{1}{2} \text{ mile} = \frac{1}{2} \text{ of } 5280 \text{ ft.} = 2640 \text{ ft.}$$

$$2640 \times 60 = 158400 \text{ sq. ft.}; \quad 1 \text{ A.} = 43560 \text{ sq. ft.}$$

$$158400 \text{ sq. ft.} \div 43560 = 3\frac{7}{11} \text{ A., Ans.}$$

$$9. 30000 \text{ cu. ft.} \div 10 \text{ ft.} = 3000 \text{ sq. ft.} = 333\frac{1}{3} \text{ sq. yd.}$$

$$\$0.75 \times 333\frac{1}{3} = \$250, \text{ Ans.}$$

$$10. 3 \text{ in.} = \frac{3}{36} = \frac{1}{12} \text{ yd.}; \quad \frac{25}{\cancel{300}} \times \frac{1}{\cancel{12}} = 25 \text{ sq. yd., Ans.}$$

### Article 433.

$$1. 8 \text{ rd.} = 8 \times 16\frac{1}{2} = 132 \text{ ft.}; \quad 132 \times 10 = 1320 \text{ sq. ft.}$$

$$\$0.60 \times 1320 = \$792, \text{ what he sold it for.}$$

$$\$792 - \$660 = \$132, \text{ gain, Ans.}$$

$$2. 4 \text{ qt.} = 4 \div 8 = \frac{1}{2} \text{ pk.}; \quad 3\frac{1}{2} \text{ pk.} = \frac{7}{2} \div 4 = \frac{7}{8} \text{ bu.}$$

$$7 + \frac{7}{8} = 7\frac{7}{8} \text{ bu.}; \quad \$4.80 \times 7\frac{7}{8} = \$37.80, \text{ Ans.}$$

$$3. 30 \text{ yd.} \times \frac{3}{4} \text{ yd.} = 22\frac{1}{2} \text{ sq. yd.} = 202\frac{1}{2} \text{ sq. ft.}$$

$$202\frac{1}{2} \text{ sq. ft.} \div 15 = \frac{405}{2} \times \frac{1}{\cancel{15}} = \frac{27}{2} = 13\frac{1}{2} \text{ ft., Ans.}$$

4. 1 acre = 43560 sq. ft. ;  $\frac{1}{2}$  acre =  $\frac{1}{2}$  of 43560 = 21780 sq. ft.

$\$0.30 \times 21780 = \$6534$ , what  $\frac{1}{2}$  was sold for.

$\frac{1}{2}$  of  $\$300 = \$150$ , what  $\frac{1}{2}$  was bought for.

$\$6534 - \$150 = \$6384$ , gain, Ans.

5. 0.24 lb. =  $.24 \times 16$  oz. = 3.84 oz.

$3.84$  oz. + 7 oz. = 10.84 oz., Ans.

6. 12750 ft. = 12.75 thousand ft.

$\$27.50 \times 12.75 = \$350.625$ , Ans.

7.  $132 \times 66 = 8712$  sq. ft. ; 1 acre = 43560 sq. ft.

$$\frac{8712}{43560} = \frac{1}{5} \text{ acre, Ans.}$$

8. 124 bu. 0 pk. 7 qt. = 3975 qt. ; 2 bu. 1 pk. 3 qt. = 75 qt.

$3975 \div 75 = 53$  bags, Ans.

9. 3 P.M. March 1, 1881, = 1881 y. 60 d. 15 h.

1881 y. 60 d. 15 h.

1876      7      9

---

5 y. 53 d. 6 h.

$3 \text{ y.} = 3 \times 365 \text{ d.} = 1095 \text{ d.}$  ;  $2 \text{ l.y.} = 2 \times 366 \text{ d.} = 732 \text{ d.}$

$1095 \text{ d.} + 732 \text{ d.} + 53 \text{ d.} = 1880 \text{ d.}$       Ans. 1880 d. 6 h.

10.  $125 \text{ ft.} \times 75 \text{ ft.} = 9375 \text{ sq. ft.}$

1 A. 46 sq. rd.  $18\frac{1}{2}$  sq. yd. = 56250 sq. ft.

$56250 \div 9375 = 6$  lots, Ans.

**Article 434.**

1.  $198 \text{ rd.} \times 150 \text{ rd.} = 29700 \text{ sq. rd., area of farm.}$   
 $29700 \text{ sq. rd.} \div 160 = 185\frac{5}{8} \text{ acres.}$   
 $\$32 \times 185\frac{5}{8} = \$5940, \text{ Ans.}$
2.  $\frac{(16 \text{ in.} + 9 \text{ in.})}{2} = 12\frac{1}{2} \text{ in., mean width (Art. 229).}$   
 $12\frac{1}{2} \text{ in.} \div 12 = 1\frac{1}{24} \text{ ft.; } 12 \times 1\frac{1}{24} = 12\frac{1}{2} \text{ board ft.}$   
 $12\frac{1}{2} \div 1000 = .012\frac{1}{2} \text{ thousand ft.}$   
 $\$30 \times .012\frac{1}{2} = \$0.37\frac{1}{2}, \text{ Ans.}$
3.  $1 \text{ acre} = 43560 \text{ sq. ft.; } 6 \text{ in.} = \frac{1}{2} \text{ ft.}$   
 $43560 \times \frac{1}{2} = 21780 \text{ cu. ft., Ans.}$
4.  $2\frac{1}{4} \text{ in.} \div 12 = \frac{1}{6} \text{ ft.; } 167 \times \frac{3}{16} = \frac{501}{16} = 31\frac{5}{16} \text{ sq. ft.}$   
 $31\frac{5}{16} \text{ sq. ft.} \div 9 = 3\frac{23}{16} \text{ sq. yd., Ans.}$
5.  $1 \text{ acre} = 43560 \text{ sq. ft.; } 43560 \div 50 = 871\frac{1}{5} \text{ ft., Ans.}$
6.  $(13 \text{ ft.})^3 = 2197 \text{ cu. ft.; } 8 \times 4 \times 2 = 64 \text{ cu. in. in 1 brick.}$   
 $1728 \text{ cu. in.} \div 64 \text{ cu. in.} = 27 \text{ bricks in 1 cu. ft.}$   
 $2197 \times 27 = 59319 \text{ bricks, Ans.}$
7.  $11 \text{ min. } 11 \text{ sec.} = 11\frac{11}{60} \text{ min.}$   
 $11\frac{11}{60} \text{ or } \frac{671}{60} \div 2 = \frac{671}{120} \text{ min. to sail 1 mile.}$   
 $\frac{993}{2979} \times \frac{671}{120} = \frac{666303}{40} \text{ min. to sail 2979 miles.}$   
 $\frac{666303}{40} \text{ min.} = \frac{666303}{40} \div 60 = \frac{222101}{800} \text{ hours.}$   
 $\frac{222101}{800} \text{ h.} = \frac{222101}{800} \div 24 = 11\frac{11}{8000} \text{ days, Ans.}$

8.  $50 \text{ ft.} \times 5 = 250 \text{ ft.}$

$250 \text{ ft.} \times 2 = 500 \text{ ft.}$

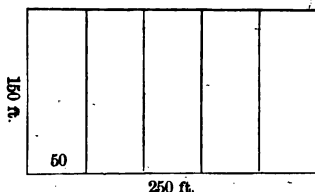
5 lots will require 6 sections  
of fence.

$150 \text{ ft.} \times 6 = 900 \text{ ft.}$

$500 \text{ ft.} + 900 \text{ ft.} = 1400 \text{ ft. of}$   
fence.

$1400 \times 4 = 5600 \text{ bd. ft., Ans.}$

$5600 \div 1000 = 5.60 \text{ thousand ft.; } \$16 \times 5.60 = \$89.60 \text{ Ans.}$



9.  $1\frac{1}{2} \text{ pt., or } \frac{3}{4} \div 2 = \frac{3}{8} \text{ qt.; } 3\frac{3}{4} \text{ qt., or } \frac{15}{4}, \div 4 = \frac{15}{16} \text{ gal.}$

$\frac{15}{16} \text{ of } \$240 = \$225, \text{ actual worth, Ans.}$

$\$240 - \$225 = \$15, \text{ gain, Ans.}$

10.  $17 \text{ ft. } 8 \text{ in.} = \frac{53}{3} \text{ ft.; } 8 \text{ ft. } 3 \text{ in.} = \frac{33}{4} \text{ ft.}$

$\frac{53}{3} \times \frac{11}{4} \times \frac{2}{8} = 1166 \text{ cu. ft.; } 1166 \text{ cu. ft.} \div 128 = 9\frac{7}{4} \text{ cd.}$

$\$8.32 \times 9\frac{7}{4} = \$75.79, \text{ Ans.}$

### Article 435.

1.  $12 \times 16\frac{1}{2} \text{ ft.} = 198 \text{ ft.; } 198 \times 110 = 21780 \text{ sq. ft.}$

1 acre = 43560 sq. ft.

$21780 \text{ sq. ft.} = \frac{21780}{43560} = \frac{1}{2} \text{ acre, Ans.}$

2. 1 mile = 63360 in.;  $63360 \div 39.37 = 1609.3 \text{ m, Ans.}$

3. 1 cubic meter of water = 1 metric ton.

1 cubic meter of gold = 19.35 metric tons.

1 metric ton = 1000 kilograms.

$19.35 \times 1000 = 19350 \text{ kilograms, Ans.}$

$$4. 3 \text{ in.} \div 12 = \frac{1}{4} \text{ ft.}; 2\frac{1}{4} \text{ ft.} = \frac{9}{4} \div 3 = \frac{3}{4} \text{ yd.}$$

$$25 \text{ yd.} + \frac{3}{4} \text{ yd.} = 25\frac{3}{4} \text{ yd.}$$

$$\$0.25 \times 25\frac{3}{4} = \$6.43\frac{3}{4}, \text{ Ans.}$$

$$5. .875 \text{ mi.} = .875 \text{ of } 320 \text{ rd.} = 280 \text{ rd.}$$

$$\$5 \div 2\frac{1}{2} = \$2, \text{ cost of 1 rd.}$$

$$\$2 \times 280 = \$560, \text{ Ans.}$$

6. The length of a meter in inches (39.37 in.) multiplied by 10000000 will give the length of a quadrant, or  $90^\circ$ , in inches;  $\frac{1}{90}$  of this product will give the length of a degree of latitude in inches, which may be changed to miles by dividing by 63360.

$$7. 40 \text{ cd.} \times 128 = 5120 \text{ cu. ft.}; 8 \text{ ft.} \times 4 \text{ ft.} = 32 \text{ sq. ft.}$$

$$5120 \div 32 = 160 \text{ ft., length of pile, Ans.}$$

$$8. (56 + 25), \text{ or } 81 \text{ ft.,} \times 2 = 162 \text{ ft., length of the four walls.}$$

$$162 \times 30 = 4860 \text{ board ft.}$$

$$4860 \text{ bd. ft.} \div 1000 = 4.86 \text{ thousand ft.}$$

$$\$10 \times 4.86 = \$48.60, \text{ Ans.}$$

$$9. 8 \text{ ft.} \times 225 \text{ ft.} = 1800 \text{ sq. ft.}; 10 \text{ ft.} \times 90 \text{ ft.} = 900 \text{ sq. ft.}$$

$$\$30 \div 900 = \$0.03\frac{1}{3}, \text{ cost of 1 sq. ft.}$$

$$\$0.03\frac{1}{3} \times 1800 = \$60, \text{ Ans.}$$

$$10. 145 \text{ rd.} \div 320 = \frac{145}{320} = \frac{29}{64} \text{ mi.}$$

$$25 \text{ mi.} + \frac{29}{64} \text{ mi.} = 25\frac{29}{64} \text{ mi.}$$

$$\$700 \times 25\frac{29}{64} = \$17817.18\frac{3}{4}, \text{ Ans.}$$

**Article 436.**

1.  $14 \text{ ft. } 9 \text{ in.} = 14\frac{3}{4} \text{ ft.}$

$16 \times 14\frac{3}{4} = 236 \text{ sq. ft., area of room.}$

$236 \text{ sq. ft.} \div 9 = \frac{236}{9} \text{ sq. yd.}$

$\frac{236}{9} \div \frac{3}{4} = \frac{944}{27} = 34\frac{8}{27} \text{ yd., Ans.}$

2.  $\frac{1}{4} \text{ A.} = \frac{43560}{4} \text{ sq. ft.} = 10890 \text{ sq. ft.}$

$4\frac{1}{2} \text{ in.} = \frac{9}{2} \div 12 = \frac{3}{8} \text{ ft.}; \quad \frac{5445}{10890} \times \frac{3}{8} = \frac{16335}{4} \text{ cu. ft.}$

$\frac{16335}{4} \div 27 = \frac{16335}{108} = 151\frac{1}{4} \text{ cu. yd., Ans.}$

3.  $8\frac{3}{4} \text{ mi.} + 10\frac{1}{4} \text{ mi.} = 19\frac{1}{2} \text{ mi.}; 4 \text{ h. } 40 \text{ min.} = 4\frac{2}{3} \text{ h.}$

$19\frac{1}{2} \times 4\frac{2}{3} = \frac{155}{8} \times \frac{14}{3} = \frac{1085}{12} = 90\frac{5}{12} \text{ mi.}$

$120 \text{ mi.} - 90\frac{5}{12} \text{ mi.} = 29\frac{7}{12} \text{ mi., Ans.}$

4.  $1 \text{ mi.} = 5280 \text{ ft.}; \quad 575\frac{5}{8} = \frac{575\frac{5}{8}}{5280} = \frac{307}{8} \times \frac{1}{5280} = \frac{307}{2816}$   
 $\frac{307}{2816} = .109\frac{7}{8}, \text{ Ans.}$

5.  $62\frac{1}{2} \text{ lb.} \times 19.25 = 1203.125 \text{ lb. in } 1 \text{ cu. ft. of gold.}$

$1203.125 \times 7000 = 8421875 \text{ gr. troy.}$

Hence 1 cu. ft. of gold weighs 8421875 gr. troy.

$8421875 \div 1728 = 4873\frac{1331}{8} \text{ gr., Ans.}$

6.  $71200 \text{ lb.} \div 2000 = 35.6 \text{ tons.}$

$\$22 \times 35.6 = \$783.20$ , value of the hay.

$19625 \text{ ft.} \div 1000 = 19.625 \text{ thousand ft.}$

$\$15 \times 19.625 = \$294.375$ , value of the boards.

$\$783.20 - \$294.375 = \$488.82\frac{1}{2}$ , Ans.

7.  $40 \text{ min.} = \frac{40}{60} = \frac{2}{3} \text{ h.}; \quad 4 \text{ h.} \div \frac{2}{3} \text{ h.} = 6$

$16 \text{ mi.} \quad 25 \text{ rd.} \quad 12 \text{ ft.}$

$6$

Ans.  $96 \text{ mi.} \quad 154 \text{ rd.} \quad 6 \text{ ft.}$

8.  $39 \text{ T.} \quad 16 \text{ cwt.} \quad 35 \text{ lb.} = 79635 \text{ lb.}$

$79635 \text{ lb.} \div 67 = 1188\frac{33}{67} \text{ lb., Ans.}$

9.  $4 \text{ h.} \quad 44 \text{ min.}$

$15$

$71^\circ \quad 0'$ , Ans.

10.  $18 \text{ ft.} \quad 8 \text{ in.} = 18\frac{2}{3} = \frac{56}{3} \text{ ft.}; \quad 10 \text{ ft.} \quad 6 \text{ in.} = 10\frac{1}{2} = \frac{21}{2} \text{ ft.}$

$28$

$7$

$\frac{56}{3} \times \frac{21}{2}$

$= 196 \text{ sq. ft.}; \quad 196 \div 9 = 21\frac{7}{9} \text{ sq. yd.}$

$21\frac{7}{9} \div \frac{3}{4} = \frac{196}{9} \times \frac{4}{3} = \frac{784}{27} = 29\frac{1}{27} \text{ yd.}$

$\$2 \times 29\frac{1}{27} = \$58.07\frac{1}{27}$ , cost of the \$2 carpeting.

$21\frac{7}{9} \div 1 = 21\frac{7}{9} \text{ yd.}$

$\$1.75 \times 21\frac{7}{9} = \$38.11\frac{1}{9}$ , cost of the \$1.75 carpeting.

$\$58.07\frac{1}{27} - \$38.11\frac{1}{9} = \$19.96\frac{2}{27}$

The \$2 carpet is  $\$19.96\frac{2}{27}$  more expensive.



**Article 437.**

1.  $24 \times 160 \text{ sq. rd.} = 3840 \text{ sq. rd.}$

$$3840 \text{ sq. rd.} \div 80 = 48 \text{ rd., Ans.}$$

2.  $25 \text{ rd. square} = 25 \times 25 = 625 \text{ sq. rd.}$

$$625 \text{ sq. rd.} - 25 \text{ sq. rd.} = 600 \text{ sq. rd., Ans.}$$

3.  $50 \times 20 \times 12 = 12000 \text{ cu. ft.}$

$$58.5 \text{ lb.} \times 12000 = 702000 \text{ lb.}$$

$$702000 \text{ lb.} \div 2000 = 351 \text{ T., Ans.}$$

4.  $15^\circ \text{ of longitude} = 1 \text{ hour of time.}$

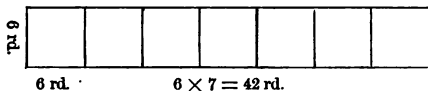
Hence,

$$\begin{array}{r} 15 \text{ ) } 4^\circ \quad 40' \\ \hline \text{Ans. } 0 \text{ h. } 18 \text{ min. } 40 \text{ sec.} \end{array}$$

5.  $5 \text{ T. } 9 \text{ cwt. } 75 \text{ lb.} = 175600 \text{ oz.}$

$$\$0.01 \times 175600 = \$1756, \text{ Ans.}$$

6. 7 lots will require 8 sections of fence each 6 rd. long, and two sections each 42 rd.



$$6 \text{ rd.} \times 8 = 48 \text{ rd.}; \quad 42 \text{ rd.} \times 2 = 84 \text{ rd.}$$

$$48 \text{ rd.} + 84 \text{ rd.} = 132 \text{ rd. of fence.}$$

$$\$2.37\frac{1}{2} \times 132 = \$313.50, \text{ Ans.}$$

7.  $12 \times 8 \times 6 = 576 \text{ cu. ft.}; \quad 576 \text{ cu. ft.} \div 128 = 4\frac{1}{2} \text{ cd.}$

$$\$4.50 \times 4\frac{1}{2} = \$20.25, \text{ Ans.}$$

8.  $7 \text{ mi. } 190 \text{ rd.} = 40095 \text{ ft.}$

$$\frac{25000}{40095} = \frac{5000}{8019} = .6235\frac{1534}{8019}, \text{ Ans.}$$

$$9. \quad 2436 \text{ lb.} + 2150 \text{ lb.} + 1735 \text{ lb.} + 3462 \text{ lb.} = 9783 \text{ lb.}$$

$$9783 \text{ lb.} \div 2000 = 4.8915 \text{ tons.}$$

$$\$5.25 \times 4.8915 = \$25.68\frac{3}{40}, \text{ Ans.}$$

$$10 \quad 15 \text{ in.} = \frac{15}{12} = \frac{5}{4} \text{ ft.}$$

$$100 \text{ ft.} + 75 \text{ ft.} = 175 \text{ ft., length of walk.}$$

$$175 \times \frac{2}{8} \times \frac{5}{4} = 1750 \text{ cu. ft.}$$

$$8 \times \frac{2}{8} \times \frac{5}{4} = 80 \text{ cu. ft. in corner.}$$

$$1750 \text{ cu. ft.} + 80 \text{ cu. ft.} = 1830 \text{ cu. ft., Ans.}$$

### Article 438.

$$1. \quad 6\frac{1}{4}\% = \frac{6\frac{1}{4}}{100} = \frac{25}{4} \times \frac{1}{100\frac{4}{4}} = \frac{1}{16}.$$

$$12\frac{1}{2}\% = \frac{12\frac{1}{2}}{100} = \frac{25}{2} \times \frac{1}{100\frac{4}{4}} = \frac{1}{8}.$$

$$8\frac{1}{3}\% = \frac{8\frac{1}{3}}{100} = \frac{25}{3} \times \frac{1}{100\frac{4}{4}} = \frac{1}{12}.$$

$$16\frac{2}{3}\% = \frac{16\frac{2}{3}}{100} = \frac{50}{3} \times \frac{1}{100\frac{2}{2}} = \frac{1}{6}.$$

$$66\frac{2}{3}\% = \frac{66\frac{2}{3}}{100} = \frac{200}{3} \times \frac{1}{100} = \frac{2}{3}.$$

$$2. \frac{7}{50} = \frac{7}{50} \text{ of } \frac{2}{100} \% = 14\% ; \quad \frac{11}{25} = \frac{11}{25} \text{ of } \frac{4}{100} \% = 44\% .$$

$$\frac{2}{5} = \frac{2}{5} \text{ of } \frac{20}{100} \% = 40\% ; \quad \frac{7}{8} = \frac{7}{8} \text{ of } 100\% = 87\frac{1}{2}\% .$$

$$\frac{3}{5} = \frac{3}{5} \text{ of } \frac{20}{100} \% = 60\% ; \quad \frac{5}{7} = \frac{5}{7} \text{ of } 100\% = 71\frac{3}{7}\% .$$

$$\frac{25}{40} = \frac{25}{40} \text{ of } \frac{5}{100} \% = 62\frac{1}{2}\% .$$

## 3.

(1.) Percentage treats of computing in hundredths. (Art. 235.)

(2.) The base is the number of which the hundredths are taken. (Art. 237.)

(3.) The rate per cent is the number of hundredths. (Art. 236.)

$$4. 75\% \text{ of } 60\% = .45 = \frac{45}{100} = \frac{9}{20}, \text{ Ans.}$$

$$5. 87\frac{1}{2}\% \text{ of } \$5000 = \$5000 \times .87\frac{1}{2} = \$4375.$$

$$0.87\frac{1}{2}\% \text{ of } \$5000 = \$5000 \times .0087\frac{1}{2} = \$43.75.$$

$$\$4375 - \$43.75 = \$4331.25, \text{ Ans.}$$

$$6. 37\frac{1}{2}\% = \frac{3}{8} ; \quad \frac{3}{8} \text{ of } 24 \text{ h.} = 9 \text{ h.} ; \quad 1 \text{ h.} = 15^\circ \text{ of longitude.}$$

$$9 \text{ h.} = 9 \times 15^\circ = 135^\circ, \text{ Ans.}$$

$$7. 33\frac{1}{3}\% = \frac{1}{3} ; \quad \frac{1}{3} \text{ of } \frac{1}{3} = \frac{1}{9} ; \quad 25\% = \frac{1}{4} ; \quad \frac{1}{4} \text{ of } \frac{1}{4} = \frac{1}{16} .$$

$$\frac{1}{9} - \frac{1}{16} = \frac{16}{144} - \frac{9}{144} = \frac{7}{144} ; \quad \$700 = \frac{7}{144} .$$

$$\frac{\begin{array}{c} 100 \\ \$700 \\ 7 \end{array}}{\cancel{7}} \times 144 = \$14400, \text{ Ans.}$$

8.  $100\% + 25\% = 125\%$  ;  $\$5000 = 125\%$ .

$$\frac{\$5000}{125} \times 100 = \$4000, \text{ cost of house.}$$

$$\$6000 - \$4000 = \$2000, \text{ gain.}$$

$$\frac{2000}{4000} = \frac{1}{2}; \frac{1}{2} \text{ of } 100\% = 50\% \text{ gain, Ans.}$$

9.  $100\% + \frac{3}{8}\% = 100\frac{3}{8}\%$  ;  $\$12000 = 100\frac{3}{8}\%$ .

$$\frac{\$12000}{100\frac{3}{8}} \times 100 = \$11955.17, \text{ sum expended.}$$

$$\$12000 - \$11955.17 = \$44.83, \text{ brokerage.}$$

10.  $\frac{3}{4} - \frac{2}{3} = \frac{9}{12} - \frac{8}{12} = \frac{1}{12}$  ;  $\frac{1}{12} = \$1200$ .

$$\frac{12}{12} = 12 \times \$1200 = \$14400.$$

$$62\frac{1}{2}\% \text{ of } \$14400 = \$9000, \text{ Ans.}$$

### Article 439.

1.  $100\% - 15\% = 85\%$  ;  $37\frac{1}{2}\% = \frac{3}{8}$  ;  $\frac{3}{8}$  of  $85\% = 31\frac{1}{4}\%$ .

$$85\% - 31\frac{1}{4}\% = 53\frac{1}{2}\%, \text{ remainder.}$$

$$53\frac{1}{2}\% \text{ of } \$5420 = \$2879.37\frac{1}{2}, \text{ Ans.}$$

2.  $\$4563.20 \div 160 = \$28.52$ , received for 1 acre.

$$100\% - 8\% = 92\%$$
 ;  $\$28.52 = 92\%$ .

$$\frac{\$28.52}{92} \times 100 = \$31, \text{ Ans.}$$

3.  $100\% + 2\frac{1}{2}\% = 102\frac{1}{2}\%$ .

$$\$45337.50 = 102\frac{1}{2}\% \text{ of the investment.}$$

$$\frac{\$45337.50}{102\frac{1}{2}} \times 100 = \$44231.70\frac{3}{4}, \text{ sum invested.}$$

$$\$45337.50 - \$44231.70\frac{3}{4} = \$1105.79\frac{1}{4}, \text{ commission, Ans.}$$

4.  $87\frac{1}{2}\%$  of \$1800 = \$1575

$$\$1575 \times .01\frac{2}{3} = \$26.25, \text{ premium, Ans.}$$

5.  $\frac{3}{5}$  of 75% =  $\frac{225}{5} = 45\%$ ;  $\frac{2}{3}$  of 90% = 60%.

$$\frac{45}{60} = \frac{3}{4}; \quad \frac{3}{4} \text{ of } 100\% = 75\%, \text{ Ans.}$$

6.  $45\% = \frac{45}{100} = \frac{9}{20}$ ;  $\frac{9}{20}$  of  $\frac{3}{4} = \frac{27}{80}$ , part of the ship sold.

$$\$36000 = \text{value of } \frac{27}{80} \text{ of the ship.}$$

$$\frac{\$36000}{27} \times 80 = \$106666\frac{2}{3}, \text{ value of the ship.}$$

$$\frac{3}{4} - \frac{27}{80} = \frac{60}{80} - \frac{27}{80} = \frac{33}{80}, \text{ what he still owned.}$$

$$\frac{33}{80} \text{ of } \$106666\frac{2}{3} = \$44000, \text{ value of } \frac{33}{80}, \text{ Ans.}$$

7. 1 mi. = 5280 ft.; 124 rd. 2 yd.  $2\frac{1}{2}$  ft. = 2054 $\frac{1}{2}$  ft.

$$\frac{2054\frac{1}{2}}{5280} = \frac{4109}{10560} \text{ of } 100\% = 38\frac{1}{2}\frac{1}{3}\%, \text{ Ans.}$$

8.  $100\% - 40\% = 60\%$ ;  $75\% = \frac{3}{4}$ ;  $\frac{3}{4}$  of 60% = 45%.

$$\$4800 = 45\% \text{ of his debts.}$$

$$\frac{\$4800}{45} \times 100 = \$10666.66\frac{2}{3}, \text{ Ans.}$$

9.  $100\% + 2\frac{1}{2}\% = 102\frac{1}{2}\%$ .

$$\$3675 = 102\frac{1}{2}\% \text{ of the investment.}$$

$$\frac{\$3675}{102\frac{1}{2}} \times 100 = \$3585.36\frac{2}{3}, \text{ sum invested.}$$

$$\$3675 - \$3585.36\frac{2}{3} = \$89.63\frac{1}{3}, \text{ commission, Ans.}$$

10.  $\$92.80 \div .03\frac{1}{2} = \$2784$ , value of goods.

$$\$2784 + \$92.80 = \$2876.80, \text{ remittance.}$$

**Article 440.**

$$1. \quad \frac{3}{8} \div \frac{5}{9} = \frac{3}{8} \times \frac{9}{5} = \frac{27}{40}; \quad \frac{27}{40} \text{ of } 100\% = 67\frac{1}{2}\%, \text{ Ans.}$$

$$2. \quad \frac{45000}{67500} = \frac{2}{3} \text{ of } 100\% = 66\frac{2}{3}\%, \text{ Ans.}$$

$$3. \quad 110\% \text{ of } \$200 = \$220, \text{ selling price.}$$

$$100\% - 10\% = 90\%.$$

$$\$220 = 90\% \text{ of asking price.}$$

$$\frac{\$220}{90} \times 100 = \$244\frac{4}{9}, \text{ asking price.}$$

$$4. \quad \$1000 \div .02\frac{1}{2} = \$40000, \text{ Ans.}$$

5. If  $\frac{3}{4}$  of a barrel is sold for  $\frac{2}{3}$  of the cost of a barrel,  $\frac{3}{4}$  of a barrel will be sold for  $3 \times \frac{1}{4}$  of  $\frac{2}{3}$  of the cost of a barrel, or  $\frac{1}{2}$  of the cost. The gain is, therefore,  $\frac{1}{2}$  the cost, or 20%.

$$6. \quad 10\% \text{ of } \$2500 = \$250, \text{ gain; } \$2500 + \$250 = \$2750.$$

$$90\% \text{ of } \$2750 = \$2475, \text{ received for the prints.}$$

$$\$2500 - \$2475 = \$25, \text{ loss, Ans.}$$

$$7. \quad \$450 = 125\% \text{ of cost of 1st horse.}$$

$$\frac{\$450}{125} \times 100 = \$360, \text{ cost of 1st horse.}$$

$$\$450 = 75\% \text{ of cost of 2d horse.}$$

$$\frac{\$450}{75} \times 100 = \$600, \text{ cost of 2d horse.}$$

$$\$450 + \$450 = \$900, \text{ received for both horses.}$$

$$\$360 + \$600 = \$960, \text{ cost of both horses.}$$

$$\$960 - \$900 = \$60, \text{ loss.}$$

$$\frac{60}{960} = \frac{1}{16} \text{ of } 100\% = 6\frac{1}{4}\% \text{ loss, Ans.}$$

8.  $37\frac{1}{2}\%$  or  $\frac{3}{8}$  of \$1200 = \$450.  
 $\frac{450}{500} = \frac{9}{10}$  of 100% = 90%, Ans.
9.  $12\frac{1}{2}\% - 8\% = 4\frac{1}{2}\%$ ; \$0.18 =  $4\frac{1}{2}\%$  of the cost.  
 $\frac{\$0.18}{4\frac{1}{2}} \times 100 = \$4$ , cost per yd., Ans.
10. \$1 in currency = \$0.354 in gold.  
 \$1 in gold =  $\$1 \div .354 = \$2.80$  currency, Ans.

**Article 441.**

1.  $35\% + 45\% = 80\%$ ;  $100\% - 80\% = 20\%$ , what C owns.  
 $35\% = \frac{7}{20}$ ;  $\frac{7}{20}$  of \$125000 = \$43750, A's share.  
 $45\% = \frac{9}{20}$ ;  $\frac{9}{20}$  of \$125000 = \$56250, B's "  
 $20\% = \frac{1}{5}$ ;  $\frac{1}{5}$  of \$125000 = \$25000, C's "
2.  $\$5400 - \$4500 = \$900$ , gain.  
 $\frac{900}{4500} = \frac{1}{5}$  of 100% = 20%, gain, Ans.
3.  $40\%$  or  $\frac{2}{5}$  of \$65000 = \$26000.  
 $\$26000 = 125\%$  of cost of 40% of goods.  
 $\frac{\$26000}{125} \times 100 = \$20800$ , cost of 40% of goods.  
 $\$65000 - \$26000 = \$39000$ .  
 $\$39000 = 130\%$  of cost of 60% of goods.  
 $\frac{\$39000}{130} \times 100 = \$30000$ , cost of 60% of goods.  
 $\$20800 + \$30000 = \$50800$ , Ans.

4.  $100\% + 2\frac{1}{2}\% = 102\frac{1}{2}\%$ ;  $\$4500 = 102\frac{1}{2}\%$ .

$$\frac{\$4500}{102\frac{1}{2}} \times 100 = \$4390.24\frac{1}{4}, \text{ sum expended.}$$

$$\$4500 - \$4390.24\frac{1}{4} = \$109.75\frac{3}{4}, \text{ commission.}$$

5.  $15\%$  of  $\$5000 = \$750$ ;  $\$5000 - \$750 = \$4250$ .

$$20\% \text{ of } \$4250 = \$850; \$4250 - \$850 = \$3400.$$

$$\$750 + \$850 = \$1600, \text{ what he had drawn.}$$

$$12\frac{1}{2}\% \text{ or } \frac{1}{8} \text{ of } \$1600 = \$200.$$

$$\$3400 + \$200 = \$3600, \text{ Ans.}$$

6.  $\frac{9525}{15000} = \frac{127}{200} = .63\frac{1}{2}$ , or  $\$0.63\frac{1}{2}$ , Ans.

7.  $100\% - 25\% = 75\%$ ;  $\$80 = 75\%$  of cost.

$$\frac{\$80}{75} \times 100 = \$106.66\frac{2}{3}, \text{ cost per acre.}$$

$$\$106.66\frac{2}{3} \times 1.40 = \$149.33\frac{1}{3}, \text{ Ans.}$$

8.  $\$4500 \times .00\frac{3}{4} = \$33.75$ , Ans.

9.  $\$26.30 \times 6 = \$157.80$ , yearly payment.

$$100\% - 35\% = 65\%.$$

$$65\% \text{ of } \$157.80 = \$102.57, \text{ Ans.}$$

10.  $\$0.66 - \$0.55 = \$0.11$ , gain on 1 bushel of corn.

$$\frac{11}{55} = \frac{1}{5} \text{ of } 100\% = 20\%, \text{ gain.}$$

$$\$1.37\frac{1}{2} - \$1.10 = \$0.27\frac{1}{2}, \text{ gain on 1 bushel of wheat.}$$

$$\frac{27\frac{1}{2}}{110} = \frac{55}{220} = \frac{1}{4} \text{ of } 100\% = 25\%, \text{ gain.}$$

$$25\% - 20\% = 5\%, \text{ greater profit on wheat, Ans.}$$



**Article 442.**

1. 1 mile = 5280 ft. ; 45% or  $\frac{9}{20}$  of 5280 ft. = 2376 ft., Ans.

2. \$2800 - \$1600 = \$1200.

$$\frac{1200}{2800} = \frac{3}{7} \text{ of } 100\% = 42\frac{6}{7}\%, \text{ Ans.}$$

3. \$7500 = 37\frac{1}{2}\% ;  $\frac{\$7500}{37\frac{1}{2}} \times 100 = \$20000$ , Ans.

4. 75%, or  $\frac{3}{4}$ , of \$1600 = \$1200.

$$\$1200 = 62\frac{1}{2}\% \text{ of B's money.}$$

$$\frac{\$1200}{62\frac{1}{2}} \times 100 = \$1920, \text{ B's money.}$$

$$\$1600 + \$1920 = \$3520, \text{ Ans.}$$

5. \$16.25 = 20% of cost of coal.

$$\frac{\$16.25}{20} \times 100 = \$81.25, \text{ cost of coal.}$$

$$12500 \text{ lb.} \div 2000 = 6.25 \text{ tons.}$$

$$\$81.25 \div 6.25 = \$13, \text{ price per ton, Ans.}$$

6. 1880 had 366 days ; December has 31 days.

$$\frac{31}{366} \text{ of } 100\% = 8\frac{2}{3}\%, \text{ Ans.}$$

7. 100% - 40% = 60% ; 25% =  $\frac{1}{4}$  ;  $\frac{1}{4}$  of 60% = 15%.

$$\$4800 = 15\% \text{ of his indebtedness.}$$

$$\frac{\$4800}{15} \times 100 = \$32000, \text{ Ans.}$$

8.  $100\% - 77\% = 23\%$ ;  $2576 = 23\%$  of the population.

$$\frac{2576}{23} \times 100 = 11200, \text{ Ans.}$$

9.  $\$92.80 \div .05\frac{1}{2} = \$1740$ , value of the goods.

$$\$1740 + \$92.80 = \$1832.80, \text{ remittance.}$$

10.  $\$125000 \times .45 = \$56250$ , base.

$$\$56250 \times .04\frac{1}{2} = \$2531.25, \text{ premium.}$$

### Article 443.

1.  $115\% - 100\% = 15\%$ ;  $\$0.09 = 15\%$  of cost.

$$\frac{\$0.09}{15} \times 100 = \$0.60, \text{ Ans.}$$

2.  $\$900 \div .04\frac{1}{2} = \$20000$ , Ans.

3.  $1\%$  of  $\$5000 = \$50$ .

$$\$400 - \$50 = \$350, \text{ what he would receive for rent above expenses.}$$

$$\$5000 \times .06 = \$300.$$

$$\$350 - \$300 = \$50, \text{ annual gain by renting}$$

Ans. By renting, by  $\$50$ .

4.  $100\% + 15\% = 115\%$ ;  $\$874 = 115\%$ .

$$\frac{\$874}{115} \times \frac{20}{100} = \$760, \text{ cost of goods, Ans.}$$

5.  $\$5895 - \$4585 = \$1310$ ;  $\frac{1}{2}$  of  $\$1310 = \$655$ , gain.

$$\$5895 - \$655 = \$5240, \text{ cost.}$$

$$\frac{655}{5240} = \frac{131}{1048} \text{ of } 100\% = 12\frac{1}{2}\%, \text{ Ans.}$$

6.  $\$2925 \div .04\frac{1}{2} = \$65000$ , whole value.

$$\frac{3}{8} \text{ of } \$65000 = \$24375, \text{ Ans.}$$

7.  $\$24.80 = 20\% \text{ of cost}$ ;  $\frac{\$24.80}{20} \times 100 = \$124$ , cost, Ans.

8.  $\$6.65 = 95\% \text{ of cost per bbl.}$

$$\frac{\$6.65}{95} \times 100 = \$7, \text{ cost per bbl.}$$

$$\$7 \times 1.05 = \$7.35, \text{ Ans.}$$

9.  $\$500 \times .07\frac{1}{2} = \$36$ , loss on the lot.

$$\$36 = 12\% \text{ of the cost of the horse.}$$

$$\frac{\$36}{12} \times 100 = \$300, \text{ cost of the horse.}$$

$$\$300 + \$36 = \$336, \text{ received for the horse, Ans.}$$

10.  $\$1537.90 = 112\frac{3}{4}\%$ ;  $\frac{\$1537.90}{112\frac{3}{4}} \times 100 = \$1365$ , cost.

$$\$1651.65 - \$1365 = \$286.65, \text{ gain.}$$

$$\frac{286.65}{1365.00} = \frac{1911}{9100} \text{ of } 100\% = 21\%, \text{ gain, Ans.}$$

### Article 444.

1.

$$2) \$125 = \text{Principal.}$$

$$.6250 = 1 \text{ month's interest.}$$

$$39\frac{1}{10} = \text{Time in months.}$$

$$\underline{56250}$$

$$18750$$

$$625$$

$$\underline{\$24.4375} = \text{Interest at } 6\%.$$

$$4.0729 = \text{ " " } 1\%.$$

$$\underline{\$28.5104} = \text{ " " } 7\%.$$

$$125.$$

$$\text{Ans. } \underline{\$153.5104}, \text{ Amount.}$$

2.  $\$1 \times .08 = \$0.08$ , interest of  $\$1$  for 1 year.

$$\$1 \div \$0.08 = 12\frac{1}{2} \text{ years, or } 12 \text{ y. } 6 \text{ mo., Ans.}$$

3.  $\$1 \times .07 \times 3.4 = \$0.238$ .

$$\$1 + \$0.238 = \$1.238, \text{ amount of } \$1 \text{ for } 3 \text{ y. } 4 \text{ mo. } 24 \text{ d.}$$

$$\$643.76 \div 1.238 = \$520, \text{ Ans.}$$

4. From Jan. 1, 1880, to July 4, 1882, = 2 y. 6 mo. 3 d.

$$2) \$475 = \text{Principal.}$$

$$\frac{2.375}{71250} = 1 \text{ month's interest.}$$

$$\frac{30\frac{1}{10}}{2375} = \text{Time in months.}$$

$$4) \$71.4875 = \text{Interest at } 6\%.$$

$$\frac{17.8718}{\$89.3593} = \text{ " " } 1\frac{1}{2}\%.$$

$$\frac{17.8718}{\$89.3593} = \text{ " " } 7\frac{1}{2}\%.$$

5.  $\$450 \times .06 \times 1\frac{1}{2} = \$36$ , interest of  $\$450$ .

$$\$1 \times .06 \times 1\frac{1}{2} = \$0.08; \$1 + \$0.08 = \$1.08.$$

$$\$450 \div \$1.08 = \$416.66\frac{2}{3}, \text{ present worth of } \$450.$$

$$\$450 - \$416.66\frac{2}{3} = \$33.33\frac{1}{3}, \text{ discount of } \$4.50.$$

$$\$36 - \$33.33\frac{1}{3} = \$2.66\frac{2}{3}, \text{ Ans.}$$

6.  $\$450 - \$300 = \$150$ .

$$\$150 \times .06 = \$9, \text{ interest of } \$150 \text{ for } 1 \text{ year.}$$

$$\$15.30 \div \$9 = 1\frac{7}{10}; 1\frac{7}{10} \text{ y.} = 1 \text{ y. } 8 \text{ mo. } 12 \text{ d., Ans.}$$

## 7.

Principal . . . . .	\$ 875.00
Int. from Jan. 1, 1879, to Mar. 10, 1880, 1 y. 2 m. 9 d.	62.56
Amount . . . . .	<u>\$ 937.56</u>
1st payment . . . . .	225.00
New principal . . . . .	<u>\$ 712.56</u>
Int. from Mar 10, 1880, to Apr. 1, 1881, 1 y. 22 d. .	45.37
Amount . . . . .	<u>\$ 757.93</u>
2d payment . . . . .	145.00
New principal . . . . .	<u>\$ 612.93</u>
Int. from Apr. 1, 1881, to Dec. 31, 1881, 9 mo. . .	27.58
Amount due Dec. 31, 1881 . . . . . Ans.	<u>\$ 640.51</u>

8. Interest of \$ 450 for 6 mo. 3 d. at  $7\frac{1}{2}\%$  = \$ 17.16.

$$\text{\$ } 450 - \text{\$ } 17.16 = \text{\$ } 432.84, \text{ proceeds, Ans.}$$

9. Bank discount of \$ 1 for 6 mo. 3 d. = \$ 0.0305.

$$\text{Proceeds of \$ } 1 = \$ 1 - \$ 0.0305 = \$ 0.9695.$$

$$\text{\$ } 800 \div \$ 0.9695 = \$ 825.17, \text{ face of note, Ans.}$$

10.  $\text{\$ } 0.15 \times .04 \times 15 = \$ 0.09$ , int. of \$ 0.15 for 15 y. at 4 %.

$$\text{\$ } 15 \times .08 \times \frac{1}{24} = \$ 0.05, \text{ int. of \$ } 15 \text{ for 15 d. at 8 \%}$$

$$\text{\$ } 0.09 - \$ 0.05 = \$ 0.04, \text{ Ans.}$$

**Article 445.**

1.  $\text{\$ } 356.50 \times .08 \times 3\frac{1}{2} = \$ 108.93$ , interest of \$ 356.50.

$$\text{\$ } 480 \times .07 = \$ 33.60, \text{ interest of \$ } 480 \text{ for 1 y. at 7 \%}$$

$$\text{\$ } 108.93 \div \$ 33.60 = 3 \text{ y. } 2 \text{ mo. } 27+ \text{ d., Ans.}$$

2. Interest of \$ 1 for 3 mo. 24 d. at 7 % = \$ 0.022 $\frac{1}{2}$ .

$$\text{\$ } 153.75 \div 0.022\frac{1}{2} = \$ 6936.09+, \text{ Ans.}$$

3.  $\$500 \times .01 \times 2\frac{1}{2} = \$12$ , interest of \$500 at 1 %.

$$\$84 \div \$12 = 7 = 7\%, \text{ Ans.}$$

✓ 4.  $\$1525 \times .04\frac{1}{2} = \$68.625$ , 1 year's interest.

$$\frac{\$68.625 \times 214}{365} = \$40.23, \text{ Ans.}$$

✓ 5.

Principal for 1st 6 mo. . . . .	\$1360.00
Interest " " . . . . .	54.40
Principal for 2d 6 mo. . . . .	\$1414.40
Interest " " . . . . .	56.58
Principal for 3d 6 mo. . . . .	\$1470.98
Interest " " . . . . .	58.84
Compound amount for 1 y. 6 mo. . . .	\$1529.82
Given principal . . . . .	1360.00
Compound interest for 1 y. 6 mo. . .	Ans. \$169.82

6. Amount of \$1 for 1 y. 5 mo. 18 d. at 6 % = \$1.088.

$$\$1275 \div \$1.088 = \$1171.875, \text{ present worth.}$$

$$\$1275 - \$1171.875 = \$103.125, \text{ discount, Ans.}$$

7. A negotiable note is one payable to the bearer, or to the payee's order.

A note payable to order is made negotiable by the payee writing his name on the back.

8. A note is due on demand, if the time for payment is not specified.

Interest will accrue from either the date of the demand of payment, or from maturity, if the words "with interest" are omitted.

## 9.

Principal . . . . .	\$ 750.00
Int. from Jan. 15, 1878, to Sept. 20, 1879, 1 y. 8 m. 5 d.	75.63
Amount . . . . .	<u>\$ 825.63</u>
1st payment . . . . .	250.00
New principal . . . . .	<u>\$ 575.63</u>
Int. from Sept. 20, 1879, to June 12, 1880, 8 m. 23 d.	25.23
Amount . . . . .	<u>\$ 600.86</u>
2d payment . . . . .	120.00
New principal . . . . .	<u>\$ 480.86</u>
Int. from June 12, 1880, to May 25, 1881, 11 m. 13 d.	27.49
Amount due May 25, 1881 . . . . . Ans.	<u>\$ 508.35</u>

10. Bank discount of \$ 1 for 9 mo. 18 d. at 7 % = \$ 0.056.

Proceeds of \$ 1 = \$ 1 - \$ 0.056 = \$ 0.944.

\$ 1240 ÷ \$ 0.944 = \$ 1313.56—, Ans.

### Article 446.

1. \$ 700 × .07 × 2½ = \$ 122.50, simple interest.

Principal for 1st year . . . . .	\$ 700.00
Interest " " . . . . .	49.00
Principal for 2d year . . . . .	<u>\$ 749.00</u>
Interest " " . . . . .	52.43
Principal for 6 mo. . . . .	<u>\$ 801.43</u>
Interest " " . . . . .	28.05
Compound amount for 2 y. 6 mo. . . . .	<u>\$ 829.48</u>
Given principal . . . . .	<u>\$ 700.00</u>
Compound interest for 2 y. 6 mo. . . . .	<u>\$ 129.48</u>

\$ 129.48 - \$ 122.50 = \$ 6.98, Ans.

2. Interest of \$ 1 for 3 mo. 3d. at 7½ % = \$ 0.019375.

\$ 700 × .019375 = \$ 13.56, bank discount, Ans.

3.  $\$1 \times .06 \times 1\frac{1}{4} = \$0.075.$

$\$27.47 \div .075 = \$366.26\frac{2}{3}, \text{ Ans.}$

4.  $\$648 \times .01 \times 2\frac{1}{8}\frac{7}{8} = \$14.886, \text{ int. at } 1\%.$

$\$81.873 \div \$14.886 = 5\frac{1}{2}; 5\frac{1}{2}\%, \text{ Ans.}$

5. Bank discount of \$1 for 33 d. = \$0.0055.

Proceeds of \$1 = \$1 - \$0.0055 = \$0.9945.

$\$900 \div \$0.9945 = \$904.97+, \text{ face of note, Ans.}$

## 6.

Principal . . . . .	\$ 365.00
Int. from July 1, 1878, to Jan. 1, 1879, 6 mo. . . . .	10.95
Amount . . . . .	<u>\$ 375.95</u>
1st payment . . . . .	85.00
New principal . . . . .	<u>\$ 290.95</u>
Int. from Jan. 1, 1879, to July 1, 1879, 6 mo. . . . .	8.73
Amount . . . . .	<u>\$ 299.68</u>
2d payment . . . . .	125.00
New principal . . . . .	<u>\$ 174.68</u>
Int. from July 1, 1879, to Jan. 1, 1881, 1 y. 6 mo. . . . .	15.72
Amount due Jan. 1, 1881 . . . . .	Ans. <u>\$ 190.40</u>

7. Principal for 1st year . . . . .	\$ 245.00
Interest " " . . . . .	11.03
Principal for 2d year . . . . .	<u>\$ 256.03</u>
Interest " " . . . . .	11.52
Principal for 6 mo. . . . .	<u>\$ 267.55</u>
Interest " " . . . . .	6.02
Compound amount . . . . .	<u>\$ 273.57</u>
Given principal . . . . .	245.00
Compound interest for 2 y. 6 mo. . . . .	Ans. <u>\$ 28.57</u>



8. Bank discount of \$1 for 5 mo. 3 d. at 8% = \$0.034.

$$\text{Proceeds of \$1} = \$1 - \$0.034 = \$0.966.$$

$$\$217.35 \div 0.966 = \$225, \text{ face of note, Ans.}$$

9. Interest of \$1 for 93 d. at 8% = \$0.0206 $\frac{2}{3}$ .

$$\$450 \times .0206\frac{2}{3} = \$9.30, \text{ bank discount.}$$

$$\$450 - \$9.30 = \$440.70, \text{ proceeds, Ans.}$$

### 10.

Amount of \$250 for 4 mo. 3 d. at 6% = \$255.13.

4 mo. 3 d. after May 16, 1880, = Sept. 19, 1880, day of maturity.

From July 5 to Sept. 19 = 76 d., term of discount.

Interest of \$255.13 for 76 d. at 7% = \$3.77, bank discount.

$$\$255.13 - \$3.77 = \$251.36, \text{ proceeds, Ans.}$$

### Article 447.

1. From May 6, 1879, to July 7, 1881, = 2 y. 2 mo. 1 d.

$$2) \$105.23 = \text{Principal.}$$

$$.5261\bar{5} = 1 \text{ month's interest.}$$

$$26\frac{1}{3} = \text{Time in months.}$$

$$\begin{array}{r} 315690 \\ 105230 \\ \hline 1753 \end{array}$$

$$1753$$

$$1753$$

$$\text{Ans. } \$13.69743, \text{ Interest.}$$

2. \$300  $\times$  .06 = \$18.

$$\$47.25 \div \$18 = 2\frac{5}{6} \text{ y.} = 2 \text{ y. } 7 \text{ mo. } 15 \text{ d., Ans.}$$

3. \$560  $\times$  .01  $\times$  2 $\frac{3}{4}$  = \$13.30, interest of \$560 at 1%.

$$\$106.40 \div \$13.30 = 8; \quad 8\%, \text{ Ans.}$$

4. Bank discount of \$1 for 93 d. at 8% = \$0.0206 $\frac{2}{3}$ .

$$\text{Proceeds of \$1} = \$1 - \$0.0206\frac{2}{3} = \$0.9793\frac{1}{3}.$$

$$\$293.80 \div \$0.9793\frac{1}{3} = \$300, \text{ face of note, Ans.}$$

5.  $\$650 \times .06 \times 2\frac{2}{3} = \$104$ , simple interest.

Principal for 1st year . . . . .	\$ 650.00
Interest " " . . . . .	39.00
Principal for 2d year . . . . .	<u>\$ 689.00</u>
Interest " " . . . . .	41.34
Principal for 8 mo. . . . .	<u>\$ 730.34</u>
Interest " " . . . . .	29.21
Compound amount for 2 y. 8 mo. . . . .	<u>\$ 759.55</u>
Given principal . . . . .	650.00
Compound interest for 2 y. 8 mo. . . . .	<u>\$ 109.55</u>

$$\$109.55 - \$104 = \$5.55, \text{ Ans.}$$

6.  $\$1 \times .08 \times \frac{2}{5} = \$0.032$ , int. of \$1 for 4 mo. 24 d. at 8%.

$$\$78.08 \div .032 = \$2440, \text{ principal, Ans.}$$

7. From Jan. 6, 1880, to April 18, 1880, = 3 mo. 12 d.

$$\$500 \times .01 \times \frac{17}{60} = \$1.416\frac{2}{3}, \text{ interest of \$500 at 1\%}$$

$$\$12.75 \div \$1.416\frac{2}{3} = 9; \text{ rate, 9 per cent.}$$

From Jan. 6, 1880, to Feb. 23, 1881, = 1 y. 1 mo. 17 d.

$$\begin{array}{rcl}
 2) \$500 & = & \text{Principal} \\
 \hline
 2.50 & = & 1 \text{ month's interest.} \\
 131\frac{1}{2} & = & \text{Time in months.} \\
 \hline
 750 & & \\
 250 & & \\
 \hline
 1416\frac{2}{3} & & \\
 \$33.916\frac{2}{3} & = & \text{Interest at 6\%} \\
 16.958\frac{1}{3} & = & \text{" " 3\%} \\
 \hline
 \$50.875 & = & \text{" " 9\%} \\
 500 & & 
 \end{array}$$

$$\text{Ans. } \$550.875 = \text{Amount.}$$

## 8.

Principal . . . . .	\$ 320.00
Int. from July 14, 1874, to Dec. 24, 1874, 5 mo. 10 d.	11.38
Amount . . . . .	<u>\$ 331.38</u>
Payment . . . . .	180.00
New principal . . . . .	<u>\$ 151.38</u>
Int. from Dec. 24, 1874, to March 30, 1875, 3 mo. 6 d.	3.23
Amount due March 30, 1875 . . . . . Ans.	<u>\$ 154.61</u>

9. From July 6, 1881, to Nov. 18, 1881, = 135 d.  
 135 d. + 3 d. = 138 d., term of discount.  
 Int. of \$ 1728 for 138 d. at 6 % = \$ 39.744, bank discount.  
 $\$ 1728 - \$ 39.744 = \$ 1688.256$ , proceeds, Ans.

10. Principal for 1st 6 mo. . . . .	\$ 860.00
Interest " " . . . . .	30.10
Principal for 2d 6 mo. . . . .	<u>\$ 890.10</u>
Interest " " . . . . .	31.15
Principal for 3d 6 mo. . . . .	<u>\$ 921.25</u>
Interest " " . . . . .	32.24
Compound amount for 18 mo. . . . . Ans.	<u>\$ 953.49</u>

## Article 448.

1.  $\$ 275 - \$ 175 = \$ 100$ , interest.  
 $\$ 175 \times .06 = \$ 10.50$ ;  $\$ 100 \div \$ 10.50 = 9\frac{1}{2}$ .  
 $9\frac{1}{2}$  y. = 9 y. 6 mo. 8 $\frac{1}{2}$  d., Ans.
2. From Jan. 10, 1881, to July 10, 1881, = 6 mo.  
 $\$ 500 \times .01 \times \frac{1}{2} = \$ 2.50$ .  
 $\$ 529.16\frac{2}{3} - \$ 500 = \$ 29.16\frac{2}{3}$ , interest.  
 $\$ 29.16\frac{2}{3} \div \$ 2.50 = 11\frac{2}{3}$  per cent, Ans.

3. From July 5, 1868, to June 1, 1870, = 1 y. 10 mo. 27 d.

$$\begin{array}{r} 2) \$1250 = \text{Principal.} \\ \underline{6.25} = 1 \text{ month's interest.} \\ 22\frac{2}{3} = \text{Time in months.} \\ \underline{1250} \end{array}$$

1250

5625

$$\begin{array}{r} 3) \$143.125 = \text{Interest at 6\%.} \\ \underline{47.708\frac{1}{3}} = \text{" " 2\%.} \\ \$190.833\frac{1}{3} = \text{" " 8\%.} \\ \underline{1250.} \end{array}$$

Ans.  $\$1440.833\frac{1}{3} = \text{Amount.}$

4. Amount of \$1 for 60 d. at 6% = \$1.01.

$$\$450 \div \$1.01 = \$445.544, \text{ present worth.}$$

$$\$450 - \$445.544 = \$4.456, \text{ discount.}$$

$$\text{Int. of } \$450 \text{ for 63 d. at 6\%} = \$4.725, \text{ bank discount.}$$

$$\$4.725 - \$4.456 = \$0.269, \text{ Ans.}$$

### 5.

Principal . . . . .	\$ 425.00
Int. from Mar. 25, 1880, to June 1, 1881, 1 y. 2 mo. 7 d.	40.33
Amount . . . . .	<u>\$ 465.33</u>
1st payment . . . . .	75.00
New principal . . . . .	<u>\$ 390.33</u>
Int. from June 1, 1881, to Dec. 30, 1881, 6 mo. 29 d.	18.13
Amount . . . . .	<u>\$ 408.46</u>
2d payment . . . . .	120.00
New principal . . . . .	<u>\$ 288.46</u>
Int. from Dec. 30, 1881, to Sept. 1, 1882, 8 mo. 2 d.	15.51
Amount due Sept. 1, 1882 . . . . .	Ans. <u>\$ 303.97</u>

6.  $\$1 \times .07 \times 2\frac{1}{2} = \$0.175$ ;  $\$1 + \$0.175 = \$1.175$ .

$$\$1410 \div \$1.175 = \$1200, \text{ present worth.}$$

$$\$1410 - \$1200 = \$210, \text{ discount, Ans.}$$

7. 3 mo. 3 d. after May 10 = Aug. 13, day of maturity.  
 From June 10 to Aug. 13 = 64 d., term of discount.  
 Int. of \$1 for 64 d. at 6% = \$0.010 $\frac{2}{3}$ , bank discount.  
 $\$1 - \$0.010\frac{2}{3} = \$0.989\frac{1}{3}$ , proceeds.  
 $\$395.80 \div .989\frac{1}{3} = \$400.06\frac{3}{4}$ , face of note, Ans.

## 8.

Principal . . . . .	\$ 2000.00
Int. fr. June 15, 1880, to Aug. 27, 1881, 1y. 2m. 12d. . . . .	192.00
Amount . . . . .	<u>\$ 2192.00</u>
Payment . . . . .	1450.00
Amount due Aug. 27, 1881 . . . . .	<u>\$ 742.00</u>

\$ 742.

Aug. 27, 1881.

For value received I promise to pay Henry Smith, or order, seven hundred forty-two dollars, on demand, with interest at 8 per cent.

GEORGE PAGE.

9.  $\$500000 \times .03\frac{1}{2} = \$17500$ , annual income.  
 $\$17500 \div 4 = \$4375$ , quarterly income.

10. The annual income of a share of 8% stock is \$8. If the cost is 160, the income is  $\frac{8}{160}$ , or 5%, of the cost. The annual income of a share of 4% stock is \$4. If the cost is 120, the income is  $\frac{4}{120}$ , or  $3\frac{1}{3}\%$ , of the cost.

$5\% - 3\frac{1}{3}\% = 1\frac{2}{3}\%$  on the investment, loss, Ans.

**Article 449.**

## 1.

The annual income of a share of 6% stock is \$6.

If the cost is 120, the income is  $\frac{6}{120}$ , or  $\frac{1}{20}$ , or 5%, of the cost, Ans.

2.  $\$1800 \div .04\frac{1}{2} = \$40000$ , sum invested, Ans.

3.  $10\% \text{ of } \$100 = \$10.$

$\$100 - \$10 = \$90$ , the cost of one share.

$\$112 - \$90 = \$22$ , gain on one share.

$\frac{22}{90} = \frac{11}{45}$ ;  $\frac{11}{45}$  of  $100\% = 24\frac{4}{9}\%$ , gain, Ans.

4.  $100\% - 33\% = 67\%.$

$67\% \text{ of } \$100 = \$67$ , cost of 1 share.

$100\% - 20\% = 80\%.$

$80\% \text{ of } \$100 = \$80$ , what 1 share was sold for.

$\$80 - \$67 = \$13$ , gain on 1 share.

$\frac{13}{67}$  of  $100\% = 19\frac{4}{11}\%$  gain, Ans.

5.  $\$164\frac{1}{2} + \frac{1}{2} = \$164\frac{3}{4}$ , cost of 1 share.

$\$25000 \div 164\frac{3}{4} = 151$  shares.  $\$122\frac{3}{4}$  left, Ans.

6.  $300 \times 4 \text{ mo.} = 1200 \text{ mo.}$

If he can have  $\$1$  for 1200 mo., he can have  $\$800$  as many months as  $1200 \div 800 = 1\frac{1}{2} \text{ mo.}$ , Ans.

7.  $700 \times 10 \text{ mo.} = 7000 \text{ mo.}$

$\frac{300}{200}$

$200 \times 6 \text{ mo.} = 1200 \text{ mo.}$

$\frac{200}{200} \quad ) \frac{5800}{29 \text{ mo.}}$

$29 \text{ mo.} - 10 \text{ mo.} = 19 \text{ mo.}$ , Ans.

8.  $\pounds 500 \text{ } 6 \text{ } d. = \pounds 500.025.$

$\$4.86\frac{1}{2} \times 500.025 = \$2432.62\frac{13}{200}$ , Ans.

9. March 11, 1880, + 4 mo. = July 11, 1880.

April 7 to July 11 = 95 d.; May 15 to July 11 = 57 d.

June 20 to July 11 = 21 d.

$$400 \times 95 \text{ d.} = 38000 \text{ d.}$$

$$270 \times 57 \text{ " } = 15390 \text{ "}$$

$$350 \times 21 \text{ " } = 7350 \text{ "}$$

$$\begin{array}{r} 1020 \qquad \qquad 60740 \text{ d.} \\ \hline \end{array}$$

$$\$1850 - \$1020 = \$830; \quad 60740 \text{ d.} \div 830 = 73 + \text{d.}$$

July 11, 1880, + 73 d. = Sept. 22, 1880, Ans.

10.

$$\frac{2400}{600}$$

$$\frac{800 \times 6 = 4800 \text{ mo.}}{1000 \times 10 = 10000 \text{ "}}$$

$$\frac{2400}{14800 \text{ "}}$$

$$\frac{2400}{14800 \text{ "}}$$

$$6\frac{1}{2} \text{ mo.} = 6 \text{ mo. } 5 \text{ d.}$$

Aug. 1 + 6 mo. 5 d. = Feb. 6, 1882, Ans.

### Article 450.

$$1. \quad \frac{1}{2} \text{ of } \frac{5}{8} = \frac{5}{16}; \quad \frac{5}{16} \div 2\frac{1}{2} = \frac{5}{16} \times \frac{5}{12} = \frac{25}{192}, \text{ Ans.}$$

$$2. \quad £44 \text{ } 16 \text{ s.} = £44.8; \quad £5 \text{ } 12 \text{ s.} = £5.6$$

$$44.8 : 5.6 = 72 \text{ yd.} : x$$

$$\frac{\overset{9}{5.6 \times 72}}{\underset{8}{44.8}} = 9 \text{ yd., Ans.}$$

$$3. \quad \left. \begin{array}{l} 18 : 8 \\ 3\frac{1}{2} : 2\frac{1}{2} \\ 67\frac{1}{2} : 450 \end{array} \right\} = 4\frac{1}{2} \text{ ft.} : x \quad \frac{\overset{4}{8} \times \overset{2}{6} \times 2 \times \overset{50}{5} \times \overset{9}{450} \times 9}{\underset{9}{18} \times 23 \times \underset{27}{135} \times 2 \times 2} =$$

$$\underset{3}{8} \quad 8\frac{1}{2} \text{ ft., Ans.}$$

$$4. \quad 12 : 7 = 15\frac{1}{2} \text{ d.} : x \quad \frac{7 \times 31}{12 \times 2} = \frac{217}{24} = 9\frac{1}{4} \text{ days, Ans.}$$

$$5. \quad \left. \begin{array}{l} 10 : 11 \\ 10 : 11 \end{array} \right\} = 6 \text{ oz.} : x \quad \frac{11 \times 11 \times 6}{10 \times 10} = 7\frac{3}{5} \text{ ounces, Ans.}$$

$$6. \quad \left. \begin{array}{l} 9 : 5 \\ 2\frac{1}{2} : 3\frac{3}{4} \\ 8 : 7\frac{1}{2} \end{array} \right\} = 30 \text{ acres} : x \quad \frac{\overset{5}{\cancel{5}} \times \overset{15}{\cancel{2}} \times \overset{15}{\cancel{30}} \times 11 \times \overset{5}{\cancel{15}}}{\underset{3}{\cancel{9}} \times \underset{4}{\cancel{5}} \times \underset{8}{\cancel{8}} \times 3 \times \underset{2}{\cancel{2}}} = 22\frac{1}{2} \text{ acres, Ans.}$$

$$7. \quad \left. \begin{array}{l} 75 : 50 \\ \frac{14}{16} : 1\frac{1}{2} \end{array} \right\} :: 4\frac{1}{2} \text{ mo.} : x \quad \frac{\overset{2}{\cancel{50}} \times \overset{4}{\cancel{16}} \times \overset{8}{\cancel{3}} \times 9}{\overset{7}{\cancel{75}} \times \overset{7}{\cancel{14}} \times \underset{2}{\cancel{2}} \times \underset{2}{\cancel{2}}} = 5\frac{1}{2} \text{ mo., Ans.}$$

$$8. \quad \left. \begin{array}{l} 32 : 48 \\ 60 : 80 \\ 6 : 8 \end{array} \right\} = 36 \text{ men} : x \quad \frac{\overset{12}{\cancel{48}} \times \overset{4}{\cancel{80}} \times \overset{12}{\cancel{36}}}{\overset{4}{\cancel{60}} \times \overset{3}{\cancel{60}} \times \underset{6}{\cancel{6}}} = 96 \text{ men, Ans.}$$

$$9. \quad \left. \begin{array}{l} 25 : 45 \\ 4 : 7\frac{1}{2} \\ 3 : 6 \\ 9 : 8 \\ 9\frac{1}{2} : 8\frac{1}{2} \end{array} \right\} = 19 \text{ men} : x$$

$$\frac{\overset{3}{\cancel{45}} \times \overset{3}{\cancel{15}} \times \overset{2}{\cancel{6}} \times \overset{2}{\cancel{8}} \times 17 \times 19 \times 2}{\overset{3}{\cancel{25}} \times \underset{5}{\cancel{2}} \times \underset{4}{\cancel{4}} \times \underset{9}{\cancel{9}} \times \underset{2}{\cancel{2}} \times \underset{3}{\cancel{3}} \times \underset{19}{\cancel{19}}} = 102 \text{ men, Ans.}$$

$$10. \quad \left. \begin{array}{l} 36 : 48 \\ 12 : 9 \\ 12 : 9 \end{array} \right\} = 8 \text{ men} : x \quad \frac{\overset{4}{\cancel{48}} \times \overset{3}{\cancel{9}} \times \overset{2}{\cancel{9}} \times \overset{2}{\cancel{8}}}{\overset{3}{\cancel{36}} \times \underset{3}{\cancel{12}} \times \underset{4}{\cancel{12}}} = 6 \text{ men, Ans.}$$



**Article 451.**

1.  $\frac{9}{9} - \frac{5}{9} = \frac{4}{9}$ , A's part of capital.

$$\frac{4}{9} \text{ of } \$4500 = \$2000, \text{ A's share of gain.}$$

2. 3 cows for 2 mo. = 6 cows for 1 mo.

2 " " 4 " = 8 " "

2 $\frac{3}{4}$  " " 3 " = 8 " "

The entire stock =  $\overline{22}$  " "

$$\frac{6}{22} = \frac{3}{11}; \frac{3}{11} \text{ of } \$55 = \$15, \text{ 1st man pays.}$$

$$\frac{8}{22} = \frac{4}{11}; \frac{4}{11} \text{ of } \$55 = \$20, \text{ 2d " "}$$

$$\frac{8}{22} = \frac{4}{11}; \frac{4}{11} \text{ of } \$55 = \$20, \text{ 3d " "}$$

3. \$2000 for 4 mo. = \$8000 for 1 mo.

\$3000 " 8 " = 24000 "

Ames's entire stock =  $\overline{\$32000}$  "

Howe's \$2000 for 12 mo. = \$24000 for 1 mo.

\$32000 + \$24000 = \$56000, entire capital.

$$\frac{32000}{56000} = \frac{4}{7}; \frac{4}{7} \text{ of } \$2800 = \$1600, \text{ Ames's gain.}$$

$$\frac{24000}{56000} = \frac{3}{7}; \frac{3}{7} \text{ of } \$2800 = \$1200, \text{ Howe's gain.}$$

4.  $280 \times \$1.25 = \$350.$

$125 + 150 + 200 + 225 = 700$  sheep.

A's stock  $= \frac{125}{700} = \frac{5}{28}$ ;  $\frac{5}{28}$  of \$350 = \$62.50, A pays.

B's "  $= \frac{150}{700} = \frac{3}{14}$ ;  $\frac{3}{14}$  of \$350 = \$75.00, B "

C's "  $= \frac{200}{700} = \frac{2}{7}$ ;  $\frac{2}{7}$  of \$350 = \$100.00, C "

D's "  $= \frac{225}{700} = \frac{9}{28}$ ;  $\frac{9}{28}$  of \$350 = \$112.50, D "

5.  $\$800 + \$1000 = \$1800.$

$\$2250 - \$1800 = \$450$ , C's gain.

C has  $\frac{450}{2250} = \frac{1}{5}$  of whole gain; he must have  $\frac{1}{5}$  of whole capital.

$\$3000 = \frac{1}{5}$ ;  $\frac{5}{5} = 5 \times \$3000 = \$15000.$

A's gain  $= \frac{800}{2250} = \frac{16}{45}$ ;  $\frac{16}{45}$  of \$15000 = \$5333 $\frac{1}{3}$ , A's stock.

B's "  $= \frac{1000}{2250} = \frac{4}{9}$ ;  $\frac{4}{9}$  of \$15000 = \$6666 $\frac{2}{3}$ , B's stock.

6. A's \$1300 for 12 mo. = \$15600 for 1 mo.

B's \$1000 " 10 " = 10000 "

C's \$900 " 5 " = 4500 "

The entire stock = \$30100 "

$\frac{15600}{30100} = \frac{156}{301}$ ;  $\frac{156}{301}$  of \$750 = \$388 $\frac{11}{301}$ , A's gain.

$\frac{10000}{30100} = \frac{100}{301}$ ;  $\frac{100}{301}$  of \$750 = \$249 $\frac{51}{301}$ , B's "

$\frac{4500}{30100} = \frac{45}{301}$ ;  $\frac{45}{301}$  of \$750 = \$112 $\frac{38}{301}$ , C's "

7.  $\$4000 = \frac{2}{5}$  of capital.

$$\frac{\$4000}{2} \times 5 = \$10000, \text{ whole capital.}$$

$$20\% \text{ of } \$10000 = \$2000.$$

$$\$2000 - \$500 = \$1500, \text{ net gain.}$$

$$\frac{3}{5} \text{ of } \$1500 = \$900, \text{ 1st man's share.}$$

$$\frac{2}{5} \text{ of } \$1500 = \$600, \text{ 2d " "}$$

8.  $\$6 + \$10 + \$14 = \$30$ ;  $\frac{7}{15}$  of  $\$37680 = \$17584$ .

$$\frac{6}{30} = \frac{1}{5}; \frac{1}{5} \text{ of } \$17584 = \$3516.80, \text{ A's gain.}$$

$$\frac{10}{30} = \frac{1}{3}; \frac{1}{3} \text{ of } \$17584 = \$5861.33\frac{1}{3}, \text{ B's gain.}$$

$$\frac{14}{30} = \frac{7}{15}; \frac{7}{15} \text{ of } \$17584 = \$8205.86\frac{2}{3}, \text{ C's gain.}$$

9.

A can do  $\frac{1}{6}$  in 1 day; B can do  $\frac{1}{8}$  in 1 day; C can do  $\frac{1}{10}$  in 1 day.

They can all do  $\frac{1}{6} + \frac{1}{8} + \frac{1}{10} = \frac{47}{120}$ , in 1 day. It will take as

many days to do the whole as  $\frac{120}{47} \div \frac{47}{120} = 2\frac{4}{47}$  days, Ans.

10.  $\$1800 + \$750 + \$1950 = \$4500$ .

$$\$205 + \$260 + \$1200 = \$1665.$$

$$\frac{1665}{4500} = \frac{37}{100} = 37\%, \text{ what he can pay.}$$

$$37\% \text{ of } \$1800 = \$666, \text{ A receives.}$$

$$37\% \text{ of } \$750 = \$277.50, \text{ B receives.}$$

$$37\% \text{ of } \$1950 = \$721.50, \text{ C receives.}$$

**Article 452.**

- 1.
- $92\frac{54}{44}$
- ( 962, Ans.

$$\begin{array}{r}
 81 \\
 186 \overline{) 1154} \\
 \underline{1116} \phantom{00} \\
 3844 \\
 1922 \overline{) 3844} \\
 \underline{3844}
 \end{array}$$

- 2.
- $\sqrt{.1369} + \sqrt{1296} = .37 + 36 = 36.37$
- , Ans.

- 3.
- $160^2 - 130^2 = 25600 - 16900 = 8700$

$$\sqrt{8700} = 93.27 \text{ ft.}, \text{ Ans.}$$

- 4.
- $216 \times 24 = 5184 \text{ sq. rd.}; \sqrt{5184} = 72 \text{ rd.}$

(216 + 24), or 240,  $\times 2 = 480 \text{ rd. around the 1st field.}$

$72 \times 4 = 288 \text{ rd. around the 2d field.}$

$\$312 \div 480 = \$0.65$ , cost of 1 rd.

$$288 \times \$0.65 = \$187\frac{1}{2}, \text{ Ans.}$$

- 5.
- $0.008^3 = 0.000000512$
- ;
- $\sqrt[3]{0.008} = 0.2$

$$0.2 - 0.000000512 = 0.199999488, \text{ Ans.}$$

- 6.
- $810 \text{ sq. ft.} \times 10 = 8100 \text{ sq. ft.}, \text{ area of garden.}$

$\sqrt{8100} = 90 \text{ ft. on 1 side.}$

$90 \text{ ft.} \times 4 = 360 \text{ ft. around the garden.}$

$$360 \text{ ft.} \div 16\frac{1}{2} = 21\frac{2}{11} \text{ rd.}, \text{ Ans.}$$

- 7.
- $34'012'224$
- (324, Ans.

27	
2700	7012
180	
4	
2884	5768
307200	1244224
3840	
16	
311056	1244224

- 8.
- $800^2 + 600^2 = 640000 + 360000 = 1000000$
- .
- +

 $\sqrt{1000000} = 1000$  m, length of diagonal.

1000 meters = 10 hektometers.

$$1\frac{1}{2} \text{ min.} \times 10 = 12 \text{ min., Ans.}$$

- 9.
- $12.5 \times 10 \times 5 = 625$
- cu. ft.

$$\sqrt[3]{625} = 8.549+ \text{ ft., or } 8.55 \text{ ft. nearly, Ans.}$$

+

- 10.
- $80^2 + 60^2 = 6400 + 3600 = 10000$

 $\sqrt{10000} = 100$  ft., slant height. $100 \text{ ft.} \times 60 \text{ ft.} = 6000$  sq. ft. on 1 side. $6000 \text{ sq. ft.} \times 4 = 24000$  sq. ft. of surface. $120^2 = 14400$  sq. ft., area of base.

$$14400 \times \frac{80}{3} = 384000 \text{ cu. ft., Ans.}$$

**Article 453.**

- 1.
- $45^2 : 60^2 = \$75 : x$

Or,  $2025 : 3600 = \$75 : \$133\frac{1}{3}$ , Ans.

2. 373'248 ( 72 in., Ans.

14700	30248
420	
4	
15124	30248

3. 116 ft. - 80 ft. = 36 ft., perpendicular of triangle.

$$160^2 + 36^2 = 25600 + 1296 = 26896$$

$$\sqrt{26896} = 164 \text{ ft., Ans.}$$

4. 1 acre = 160 sq. rd. ;
- $\sqrt{160} = 12.6491 + \text{rd.}$

$$12.6491 \times 4 = 50.5964 \text{ rd. ; } 50.5964 - 4 = 46.5964 \text{ rd.}$$

$$46.5964 \times 1 = 46.5964 \text{ rd., Ans.}$$

5. 12 h.
- $\times 4 = 48 \text{ h.} = 2880 \text{ min.}$

$$2880 \div 15 = 192 \text{ miles, A walks in 4 days.}$$

$$2880 \div 12 = 240 \text{ miles, B " " "}$$

$$240^2 + 192^2 = 57600 + 36864 = 94464$$

$$\sqrt{94464} = 307.3 + \text{miles, Ans.}$$

- 6.
- $\sqrt[3]{262144} = 64 \text{ in. ; } 64^2 = 4096 \text{ sq. in., area of 1 face.}$

$$4096 \times 6 = 24576 \text{ sq. in., entire surface.}$$

$$64^2 + 64^2 = 4096 + 4096 = 8192$$

$$\sqrt{8192} = 90.5 + \text{in., diagonal of one face.}$$

$$64^2 + 90.5^2 = 4096 + 8192 = 12288$$

$$\sqrt{12288} = 110.8 + \text{in., length of diagonal, Ans.}$$

- 7.
- $4^3 : 12^3 = 1 : x$
- , or
- $64 : 1728 = 1 : 27$
- , Ans.

8.  $20^2 - 12^2 = 400 - 144 = 256$ ;  $\sqrt{256} = 16$  ft.  
 $16$  ft.  $\times$   $2$  ft. =  $32$  sq. ft. covered when the board is raised.  
 $20 \times 2 = 40$  sq. ft. covered when the board is flat.  
 $40$  sq. ft. -  $32$  sq. ft. =  $8$  sq. ft., Ans.
9.  $35^2 - 15^2 = 1225 - 225 = 1000$   
 $\sqrt{1000} = 31.62+$  ft., half of width of house.  
 $31.62$  ft.  $\times$   $2 = 63.24$  ft., width of house, Ans.
10.  $100 \times 100 \times 1 = 10000$  cu. ft. in garden  $1$  ft. deep.  
 $100 \times 4 = 400$  ft. around the garden.  
 $400$  ft.  $\times$   $4$  ft. =  $1600$  sq. ft. in ditch, except corners.  
 $4^2 \times 4 = 64$  sq. ft. in corners.  
 $1600$  sq. ft. +  $64$  sq. ft. =  $1664$  sq. ft. in ditch.  
 $10000 \div 1664 = 6\frac{1}{4}$  ft., depth of ditch, Ans.

**Article 454.**

1.

$$\frac{\frac{3}{4} \text{ of } \frac{4}{5} \text{ of } 37\frac{1}{2}}{24\frac{1}{2} - 18\frac{3}{4}} = \frac{\frac{3}{4} \text{ of } \frac{4}{5} \text{ of } \overset{15}{\cancel{75}}}{\frac{98}{4} - \frac{75}{4}} = \frac{\frac{45}{2}}{\frac{23}{4}} = \frac{45}{2} \times \frac{4}{23} = \frac{90}{23} = 3\frac{1}{3}, \text{ Ans.}$$

$$2. \frac{3}{8} \text{ cwt.} = \frac{3}{8} \div 20 = \frac{3}{160} \text{ ton.}$$

$$\frac{\frac{3}{160}}{\frac{7}{8}} = \frac{3}{\cancel{160}} \times \frac{8}{7} = \frac{3}{140} = .0214\bar{2}, \text{ Ans.}$$

3.  $25\%$  of  $\$2000 = \$500$ , gain.  
 $\$2000 + \$500 = \$2500$ , what it was sold for.  
 $\$2500 = 87\frac{1}{2}\%$  of what he asked.  
 $\frac{\$2500}{87\frac{1}{2}} \times 100 = \$2857\frac{1}{2}$ , what he asked, Ans.

4. Principal . . . . .	\$ 400.00
Interest for 1 year . . . . .	28.00
Amount . . . . .	<u>\$ 428.00</u>
1st payment . . . . .	100.00
New principal . . . . .	<u>\$ 328.00</u>
Interest for 1 year . . . . .	22.96
Amount . . . . .	<u>\$ 350.96</u>
2d payment . . . . .	100.00
New principal . . . . .	<u>\$ 250.96</u>
Interest for 1 year . . . . .	17.57
Amount . . . . .	<u>\$ 268.53</u>
3d payment . . . . .	100.00
New principal . . . . .	<u>\$ 168.53</u>
Interest for 4 mo. . . . .	3.93
Amount due 3 y. 4 mo. from date . . . Ans.	<u>\$ 172.46</u>

5. Interest of \$ 1 for 93 d. at 7% = \$ 0.0180 $\frac{1}{2}$ .

\$ 1250  $\times$  0.0180 $\frac{1}{2}$  = \$ 22.60, bank discount.

\$ 1250 - \$ 22.60 = \$ 1227.40, proceeds, Ans.

6. Time to midnight =  $\frac{3}{4}$  of time to midnight; time past noon =  $\frac{3}{4}$  of time to midnight; the time from noon to midnight, 12 hours, is  $\frac{3}{4} + \frac{3}{4}$ , or  $\frac{6}{4}$ , of the time to midnight. 12 hours is  $\frac{4}{5}$  of 7 $\frac{1}{2}$  hours. The time to midnight being 7 $\frac{1}{2}$  hours, the time past noon is 12 hours - 7 $\frac{1}{2}$  hours, or 4 $\frac{1}{2}$  hours, or 4.48 P.M., Ans.

7.  $\frac{1}{4}$  acre = 10890 sq. ft.; 9 in. =  $\frac{3}{4}$  ft.

$10890 \times \frac{3}{4} \times \frac{1}{27} = 302\frac{1}{2}$  cu. yd.

\$ 0.50  $\times$  302 $\frac{1}{2}$  = \$ 151.25, Ans.



8.  $108 \times 48 = 5184$  sq. rd. ;  $\sqrt{5184} = 72$  rd.  
 $(108 + 48)$ , or 156,  $\times 2 = 312$  rd. around the 1st field.  
 $72 \times 4 = 288$  rd. around the 2d field.  
 $\$202.80 \div 312 = \$0.65$ , cost of 1 rd.  
 $288 \times \$0.65 = \$187.20$ , Ans.

9. 74'088 ( 42, Ans.

4800	10088
240	
4	
5044	10088

10.

$$\left. \begin{array}{l} 21 : 7 \\ 60 : 80 \\ 6 : 8 \\ 3 : 4 \end{array} \right\} = 12 : x \quad \frac{\overset{4}{7} \times \overset{4}{80} \times \overset{4}{8} \times 4 \times 12}{\underset{3}{21} \times \underset{3}{60} \times \underset{3}{8} \times 3} = \frac{256}{27} = 9\frac{1}{27} \text{ d., Ans.}$$

### Article 455.

1.  $6 \text{ ft.} \times 3\frac{1}{2} \text{ ft.} = 19 \text{ sq. ft.}$   
 $27 \times 19 \text{ sq. ft.} = 513 \text{ sq. ft.} = 57 \text{ sq. yd.}$

$$57 \div \frac{3}{4} = 76 \text{ yd., Ans.}$$

- |                                       |                |
|---------------------------------------|----------------|
| 2. Principal for 1st year . . . . .   | \$ 200.00      |
| Interest    "    " . . . . .          | 16.00          |
| Principal for 2d year . . . . .       | \$ 216.00      |
| Interest    "    " . . . . .          | 17.28          |
| Principal for 6 mo. 6 d. . . . .      | \$ 233.28      |
| Interest    "    " . . . . .          | 9.64           |
| Compound amount for 2 y. 6 mo. 6 d. . | Ans. \$ 242.92 |

3.  $102 \text{ A. } 64 \text{ sq. rd.} = 16384 \text{ sq. rd.}$

$$\sqrt{16384} = 128 \text{ rd., Ans.}$$

4.  $47\frac{3}{4} = \frac{24389}{512}$

$$\sqrt[3]{\frac{24389}{512}} = \frac{\sqrt[3]{24389}}{\sqrt[3]{512}} = \frac{29}{8} = 3\frac{5}{8} \text{ ft., Ans.}$$

5.  $600 \div .012 = 50000$ ;  $50000 \times .05 = 2500$

$$.005 \div 2500 = .000002, \text{ Ans.}$$

6.  $4\frac{2}{3} \div .03 = 142\frac{2}{3}$ ;  $142\frac{2}{3} : 6\frac{1}{2} = x : 8\frac{1}{2}$

$$\frac{2 \times 1000 \times 25}{13 \times 7 \times 3} = \frac{50000}{273} = 183\frac{41}{273}, \text{ Ans.}$$

7.  $25\% \text{ of } \$420 = \$105, \text{ gain.}$

$$\$420 + \$105 = \$525, \text{ what it was sold for.}$$

$$63 \text{ gal.} - 10\frac{1}{2} \text{ gal.} = 52\frac{1}{2} \text{ gal.}$$

$$\$525 \div 52\frac{1}{2} = \$10, \text{ Ans.}$$

8. From Aug. 18, 1880, to Apr. 30, 1882, = 1 y. 8 mo. 12 d.

$$2) \$1200 = \text{Principal.}$$

$$\$6.00 = 1 \text{ month's interest.}$$

$$20\frac{2}{3} = \text{Time in months.}$$

$$\underline{12000}$$

$$240$$

$$\$122.40 = \text{interest at } 6\%.$$

$$30.60 = \text{ " " } 1\frac{1}{2}\%.$$

$$\$91.80 = \text{ " " } 4\frac{1}{2}\%.$$

9.  $\left. \begin{array}{l} 25 : 12 \\ 6 : 5 \\ 10 : 8 \end{array} \right\} = 200 : x$   $\frac{\overset{2}{12} \times \overset{8}{5} \times 8 \times \overset{8}{200}}{\underset{5}{25} \times 6 \times 10} = 64 \text{ rd., Ans.}$

10.  $7000 \times 15 \text{ d.} = 105000 \text{ d.}$  If he can have \$1 for 105000 d. he can have \$7500 as many days as 105000  $\div$  7500 = 14 days, Ans.

### Article 456.

1. The value of 7 in the number 78.342 is 70, and of 2 is 0.002.  $70 \div 0.002 = 35000$ . That is, the value of the 7 is 35000 times as great as that of the 2.

$$2. \quad \frac{3\frac{1}{2}}{7\frac{1}{2}} = \frac{\overset{2}{10}}{\underset{3}{15}} \times \frac{2}{15} = \frac{4}{9}; \quad \frac{\overset{2}{4}}{9} \text{ of } \frac{25}{2} = \frac{50}{9}$$

$$\frac{50}{9} - 4\frac{8}{9} = \frac{100}{18} - \frac{87}{18} = \frac{13}{18}, \text{ Ans.}$$

3. 85 % of .36 = .306 ; .306 of the value of the ship = \$22950.

$$\frac{\$22950}{306} \times 1000 = \$75000, \text{ Ans.}$$

4. \$8000 - \$3200 = \$4800, net earnings.

$$\$4800 \div \$80000 = .06 = 6\%.$$

The annual income of a share of 6 % stock is \$6. If the cost is \$120, the income is  $\frac{1}{20}$ , or  $\frac{1}{20}$ , or 5 %, of the cost. Ans. 5 %.

5.  $\$625 \times .08 \times 2\frac{1}{2} = \$125$ , simple interest.

Principal for 1st year . . . . . \$625.00

Interest " " . . . . . 50.00

Principal for 2d year . . . . . \$675.00

Interest " " . . . . . 54.00

Principal for 6 mo. . . . . \$729.00

Interest " " . . . . . 29.16

Compound amount for 2 y. 6 mo. . . . . \$758.16

Given principal . . . . . 625.00

Compound interest for 2 y. 6 mo. . . . . \$133.16

$$\$133.16 - \$125 = \$8.16, \text{ Ans.}$$

6. 93 d. after Feb. 12, 1881, = May 16, 1881, date when due.  
Int. of \$ 1250 for 93 d. at 6 % = \$ 19.375, bank discount.

$$\text{\$ } 1250 - \text{\$ } 19.375 = \text{\$ } 1230.625, \text{ proceeds, Ans.}$$

$$7. \left. \begin{array}{l} 5 : 6 \\ 14 : 25 \\ 8 : 10 \end{array} \right\} = 2 : 5\frac{5}{14} \quad \frac{\overset{3}{6} \times 25 \times \overset{2}{10} \times 2}{\underset{4}{5} \times 14 \times \underset{8}{8}} = \frac{75}{14} = 5\frac{5}{14} \text{ d., Ans.}$$

8. 

80 sq. rd.	80 sq. rd.
------------	------------

 1 A. = 160 sq. rd. ;  $\frac{1}{2}$  A. = 80 sq. rd.

$$\sqrt{80} = \text{width of rectangle.}$$

$$2 \times \sqrt{80} = \text{length of rectangle.}$$

$$(\sqrt{80})^2 + (2 \times \sqrt{80})^2 = 80 + (4 \times 80) = 400.$$

$$\sqrt{400} = 20 \text{ rd. in diagonal, Ans.}$$

9. 12 in.  $\times$  3.1416 = 37.6992 in., circumference of base.

$$37.6992 \times \frac{12}{2} = 226.1952$$

$$226.1952 \div 2 = 113.0976 \text{ sq. in., area of base.}$$

$$113.0976 \times \frac{12}{3} = 452.39 \text{ cu. in., Ans.}$$

10. 1 meter = 1 ten-millionth part of the distance on a meridian from the equator to the pole. Hence  $\frac{1}{4}$  of the circumference of the earth = 10000000 meters ; 4 times 10000000 meters = circumference of earth. The circumference divided by 3.1416 (Art. 222) will give the diameter.

**Article 457.**

- 1.
- $\$200 \times .08 \times 1\frac{3}{4} = \$27.47$
- , simple interest.

$$\$200 + \$27.47 = \$227.47, \text{ amount.}$$

Principal for 1 year. . . . .  $\$200.00$ Interest " " . . . . .  $16.00$ Principal for 8 mo. 18 d. . . . .  $\$216.00$ Interest " " " . . . . .  $12.38$ Compound amount for 1 y. 8 mo. 18 d. . .  $\$228.38$ 

$$\$228.38 - \$227.47 = \$0.91, \text{ Ans.}$$

2.  $\left. \begin{array}{l} 8 : 6 \\ 4 : 10 \\ 12 : 9 \end{array} \right\} = 18 : x$   $\frac{6 \times 10 \times 9 \times 18}{8 \times 4 \times 12} = \frac{405}{16} = 25\frac{5}{16} \text{ A., Ans.}$

- 3.
- $\$15000 \div 1.25 = \$12000$
- .

Hence  $\$15000$  in currency =  $\$12000$  in gold.

$$\$12000 - \$10000 = \$2000, \text{ gain.}$$

$$\frac{2000}{10000} = \frac{1}{5}; \frac{1}{5} \text{ of } 100\% = 20\%, \text{ gain, Ans.}$$

4. 1 gross = 144 tacks.

$$\$0.00002 \times 144 = \$0.00288, \text{ cost of 1 gross.}$$

$$\$12 \div \$0.00288 = 4166\frac{2}{3}, \text{ Ans.}$$

- 5.
- $(14 \text{ rd.} + 12\frac{1}{2} \text{ rd.}), \text{ or } 26\frac{1}{2} \text{ rd.,} \times 2 = 53 \text{ rd.}$

53 rd. = 874.5 ft., length of fence.

$$874.5 \times 5\frac{1}{2} = 4809\frac{3}{4} \text{ board ft.}$$

$$4809\frac{3}{4}, \text{ or } 4.809\frac{3}{4} \text{ M.} \times \$42 = \$202.0095, \text{ Ans.}$$

6. 10% of
- $\$280 = \$28$
- ;
- $\$280 - \$28 = \$252$
- , cost.

$$\$4.50 \times 72 = \$324, \text{ what it was sold for.}$$

Interest of  $\$324$  for 93 d. at 6% =  $\$5.02$ , bank discount.

$$\$324 - \$5.02 = \$318.98, \text{ proceeds of note.}$$

$$\$318.98 - \$252 = \$66.98, \text{ gain, Ans.}$$

## 7.

$$\left(\frac{1}{2}\right)^3 : 7^3 = 1\frac{3}{8} : x, \text{ or } \frac{1}{8} : 343 = 1\frac{3}{8} : 4390\frac{3}{8} \text{ oz.} = 274\frac{3}{8} \text{ lb., Ans.}$$

8.  $27 \times 8 \times 125 = 27000 \text{ cu. ft.}$

$$\sqrt[3]{27000} = 30 \text{ ft., length of 1 side.}$$

$$30 \text{ ft.}^2 = 900 \text{ sq. ft., area of 1 side, Ans.}$$

9.  $16 \text{ cwt. } 40 \text{ lb.} = \frac{41}{50} \text{ T.}; \quad \frac{41}{50} \times 20 = 16\frac{4}{5} \text{ T. in 20 loads.}$

$$\$35 \times 16\frac{4}{5} = \$574, \text{ what was received for 20 loads.}$$

$$\$574 \times .08 = \$45.92, \text{ interest for 1 year.}$$

$$\$35 \times 20 = \$700, \text{ value of 20 T.}$$

$$\$700 - \$574 = \$126, \text{ interest.}$$

$$\$126 \div \$45.92 = 2 \text{ y. } 8 \text{ mo. } 28 \text{ d., Ans.}$$

10.  $\$4.50 \div \$0.50 = 9, \text{ number of pounds.}$

$$18 \text{ ft.} \times 9 = 162 \text{ ft.} = \text{hypotenuse of triangle.}$$

$$162^2 - 56^2 = 26244 - 3136 = 23108.$$

$$\sqrt{23108} = 152\frac{1}{2} \text{ ft., height of the spire, Ans.}$$

**Article 458.**

1. Whole number of sheep = 100%.

$$\frac{4}{7} \text{ of } 100\% = 57\frac{1}{7}\% \text{ remaining; } 4\% + 57\frac{1}{7}\% = 61\frac{1}{7}\%.$$

$$100\% - 61\frac{1}{7}\% = 38\frac{6}{7}\%; \quad 68 \text{ sheep} = 38\frac{6}{7}\%.$$

$$\frac{68}{38\frac{6}{7}} \times 100 = 175 \text{ sheep, Ans.}$$

2.  $256 \times 4 \times 5 = 5120 \text{ cu. ft.}; \quad 5120 \div 128 = 40 \text{ cords.}$

$$\$152.56 \div 40 = \$3.81\frac{4}{5}, \text{ cost of 1 cord, Ans.}$$

3.  $56 \times 85 = 4760 \text{ sq. ft.}; \quad 14 \times \frac{1}{2} = 7 \text{ bd. ft. in 1 board.}$

$$4760 \div 7 = 680 \text{ boards; } 680 \times 8 = 5440 \text{ nails.}$$

$$5440 \div 68 = 80 \text{ pounds, Ans.}$$

4.  $6^2 = 36$ ;  $8^2 = 64$ ;  $36 + 64 = 100$ .

$\frac{36}{100} = \frac{9}{25}$ ;  $\frac{9}{25}$  of \$1000 = \$360, share of 1st.

$\frac{64}{100} = \frac{16}{25}$ ;  $\frac{16}{25}$  of \$1000 = \$640, share of 2d.

5.  $1200 \times .08 \times 1\frac{3}{4} = \$165.07$ , simple interest.

Principal for 1st 6 mo. . . . .	\$1200.00
Interest " " . . . . .	48.00
Principal for 2d 6 mo. . . . .	\$1248.00
Interest " " . . . . .	49.92
Principal for 3d 6 mo. . . . .	\$1297.92
Interest " " . . . . .	51.92
Principal for 2 mo. 19 d. . . . .	\$1349.84
Interest " " . . . . .	23.69
Compound amount for 1 y. 8 mo. 19 d. . .	\$1373.53
Given principal . . . . .	1200.00
Compound interest for 1 y. 8 mo. 19 d. . .	\$173.53

$\$173.53 - \$165.07 = \$8.46$ , Ans.

6.  $2304^2 = 5308416 =$  the number.

$$\begin{array}{r}
 5'308'416 \text{ ( } 174.4+ \\
 1 \\
 10^2 \times 3 = 300 \quad | \quad 4308 \\
 10 \times 7 \times 3 = 210 \quad | \\
 7^2 = 49 \quad | \\
 \hline
 559 \quad | \quad 3913 \\
 170^2 \times 3 = 86700 \quad | \quad 395416 \\
 170 \times 4 \times 3 = 2040 \quad | \\
 4^2 = 16 \quad | \\
 \hline
 88756 \quad | \quad 355024 \\
 1740^2 \times 3 = 9082800 \quad | \quad 40392000 \\
 1740 \times 4 \times 3 = 20880 \quad | \\
 4^2 = 16 \quad | \\
 \hline
 9103696 \quad | \quad 36414784 \\
 \hline
 3977216
 \end{array}$$

$$7. (1\frac{1}{2})^2 : (\frac{3}{4})^2 = 3 \text{ h.} : x, \text{ or } \frac{9}{4} : \frac{9}{16} = 3 \text{ h.} : x$$

$$\frac{4}{9} \times \frac{9}{16} \times 3 = \frac{3}{4} \text{ h., or 45 min., Ans.}$$

$$8. \$1 - \$0.02 = \$0.98, \text{ cost of } \$1 \text{ at sight.}$$

$$\$1 \times .0105 = \$0.0105, \text{ interest of } \$1 \text{ for 63 d. at 6\%.}$$

$$\$0.98 - \$0.0105 = \$0.9695, \text{ cost of } \$1 \text{ of exchange.}$$

$$\$1939 \div \$0.9695 = \$2000, \text{ face of the draft, Ans.}$$

$$9. \$508.50 \times .01 \times 2\frac{7}{8}\% = \$11.20\frac{9}{10}, \text{ int. of } \$508.50 \text{ at 1\%}$$

$$\$89.609 \div \$11.20\frac{9}{10} = 8, \text{ or 8\%, Ans.}$$

$$10. 100\% + 4\frac{1}{2}\% = 104\frac{1}{2}\%; \quad \$7315 = 104\frac{1}{2}\%.$$

$$\frac{\$7315}{104\frac{1}{2}} \times 100 = \$7000, \text{ with which to buy apples.}$$

$$\$7315 - \$7000 = \$315, \text{ commission.}$$

$$\frac{315}{6300} = \frac{1}{20}; \quad \frac{1}{20} \text{ of } 100\% = 5\%, \text{ Ans.}$$

### Article 459.

$$1. \$10000 \div 1.05 = \$9523.80\frac{3}{4}, \text{ par value.}$$

$$\$9523.80\frac{3}{4} \times .05 = \$476.19\frac{1}{4}, \text{ yearly income, Ans.}$$

$$2. 1 \text{ section} = 640 \text{ acres}; \quad 1 \text{ acre} = 0.4047^{\text{Ha}} = 4047^{\text{ca}}.$$

$$4047^{\text{ca}} \times 640 = 2590080^{\text{ca}}.$$

$$2590080 \times \$1.50 = \$3885120, \text{ Ans.}$$

$$3. 7912.5 \times 3.1416 = 24857.91 \text{ mi., circumference of earth.}$$

$$24857.91 \text{ mi.} \div 360 = 69.04\frac{7}{8} \text{ mi. in 1 degree.}$$

$$69.04\frac{7}{8} \text{ mi.} \div 60 = 1.15\frac{129}{400} \text{ mi. in 1 minute, Ans.}$$



4. A fraction is reduced to larger terms without changing the value.  $\frac{2}{3} \times 4 = \frac{8}{12}$ , the multiplication increasing the number of fractional units 4 times, and making each one  $\frac{1}{4}$  as large. Hence the value is not changed.

A fraction is reduced to smaller terms without changing the value.  $\frac{8}{12} \div 4 = \frac{2}{3}$ , the division increasing the size of the fractional units 4 times, while their number is  $\frac{1}{4}$  as large, so that the value is not changed.

5.  $18 \text{ ft.} \times 15 \text{ ft.} = 270 \text{ sq. ft.} = 30 \text{ sq. yd.}$

$$27 \text{ in.} = \frac{27}{36} = \frac{3}{4} \text{ yd.}; \quad 30 \div \frac{3}{4} = 40 \text{ yd.}$$

$$\$2.50 \times 40 = \$100, \text{ Ans.}$$

6.  $70 \text{ min.} = 1\frac{1}{2} \text{ h.}; \quad 15^\circ \text{ of longitude} = 1 \text{ h. in time.}$

$$1\frac{1}{2} \times 15^\circ = 17.5^\circ \text{ west, Ans.}$$

$$120 \text{ min.} = 2 \text{ h.}; \quad 2 \times 15^\circ = 30^\circ \text{ of longitude east, Ans.}$$

7.  $100\% + 16\frac{2}{3}\% = 116\frac{2}{3}\%; \quad \$3000 = 116\frac{2}{3}\%$

$$\frac{\$3000}{116\frac{2}{3}} \times 100 = \$2571\frac{2}{3}, \text{ cost of 1st farm.}$$

$$100\% - 12\% = 88\%; \quad \$3000 = 88\%.$$

$$\frac{\$3000}{88} \times 100 = \$3409\frac{1}{11}, \text{ cost of 2d farm.}$$

$$\$3000 + \$3000 = \$6000, \text{ what both farms were sold for}$$

$$\$2571\frac{2}{3} + \$3409\frac{1}{11} = \$5980\frac{4}{11}, \text{ what both farms cost.}$$

$$\$6000 - \$5980\frac{4}{11} = \$19\frac{7}{11}, \text{ gain, Ans.}$$

8.  $\$960 \times 2 = \$1920, \text{ annual income.}$

$$\$1920 \div .04 = \$48000, \text{ par value of stock.}$$

$$\$48000 \times 1.20 = \$57600, \text{ amount to be invested, Ans.}$$

## 9.

$$40 \text{ rd. square} = 40 \times 40 = 1600 \text{ sq. rd.}$$

$$4 \text{ A.} = 4 \times 160 \text{ sq. rd.} = 640 \text{ sq. rd.}$$

$$20 \text{ rd. square} = 20 \times 20 \text{ sq. rd.} = 400 \text{ sq. rd.}$$

$$100 \text{ sq. rd.} + 640 \text{ sq. rd.} + 400 \text{ sq. rd.} = 1140 \text{ sq. rd., what was sold.}$$

$$1600 \text{ sq. rd.} - 1140 \text{ sq. rd.} = 460 \text{ sq. rd., Ans.}$$

$$10. \sqrt{21316} = 146; \sqrt[3]{150568768} = 532.$$

$$\frac{532}{146} \text{ of } 100\% = 364\frac{2}{3}\%, \text{ Ans.}$$

**Article 460.**

$$1. 1 \text{ section} = 1 \text{ sq. mi.}; \text{ perimeter of } 1 \text{ sq. mi.} = 4 \text{ mi.}$$

$$4 \times 5280 \times \$0.12\frac{1}{2} = \$2640, \text{ cost of fencing, Ans.}$$

$$2. 40 \times \frac{3}{4} = 30 \text{ sq. yd.} = 270 \text{ sq. ft.}$$

$$270 \text{ sq. ft.} \div 18 \text{ ft.} = 15 \text{ ft., width of room, Ans.}$$

## 3.

$$\frac{\frac{3}{4} \text{ of } \frac{5}{7} \text{ of } 12\frac{2}{3}}{18\frac{1}{2} - 12\frac{2}{3}} = \frac{\frac{3}{4} \text{ of } \frac{5}{7} \text{ of } \frac{112}{9}}{18\frac{1}{2} - 12\frac{2}{3}} = \frac{\frac{140}{21}}{\frac{101}{18}} = \frac{140}{21} \times \frac{18}{101} = \frac{120}{101} = 1\frac{19}{101}, \text{ Ans.}$$

$$4. 12 \text{ cd.} = 12 \times 128 \text{ cu. ft.} = 1536 \text{ cu. ft.}$$

$$9 \text{ ft.} \times 6 \text{ ft.} = 54 \text{ sq. ft.}$$

$$1536 \div 54 = 28\frac{2}{3} \text{ ft., length of the pile, Ans.}$$

5.  $45 \times 30 = 1350$  yd.;  $\$3.75 \times 1350 = \$5062.50$ , cost.

$$\$1 \times .06 \times \frac{3}{4} = \$0.045; \$1 + \$0.045 = \$1.045.$$

$$\$5062.50 \div 1.045 = \$4844.50, \text{ present worth of } \$5062.50.$$

$$\$4 \times 1350 = \$5400, \text{ what it was sold for.}$$

$$\$1 \times .06 \times \frac{1}{3} = \$0.02; \$1 + \$0.02 = \$1.02.$$

$$\$5400 \div 1.02 = \$5294.12, \text{ present worth of } \$5400.$$

$$\$5294.12 - \$4844.50 = \$449.62, \text{ gain, Ans.}$$

6. 4 mo. 3 d. after June 15 = Oct. 18, date when due.

From Aug. 18 to Oct. 18 = 61 d., term of discount.

Int. of \$4500 for 61 d. at  $7\frac{1}{2}\%$  = \$57.18 $\frac{3}{4}$ , bank discount.

$$\$4500 - \$57.18\frac{3}{4} = \$4442.81\frac{1}{4}, \text{ proceeds, Ans.}$$

7.  $\$1 \times .04 \times 3\frac{3}{4} = \$0.15.$

$$\$1 + \$0.15 = \$1.15, \text{ amount of } \$1 \text{ for } 3 \text{ y. } 9 \text{ mo. at } 4\%.$$

$$\$520 \div 1.15 = \$452.17\frac{2}{3}, \text{ principal, Ans.}$$

$$\left. \begin{array}{l} 24 : 16 \\ 9 : 12 \\ 15 : 45 \\ 8 : 9 \\ 3 : 6 \end{array} \right\} = 6 : x \quad \frac{\overset{2}{16} \times \overset{4}{12} \times \overset{3}{45} \times 9 \times 6 \times 6}{\underset{3}{24} \times 9 \times \underset{2}{15} \times \underset{3}{8} \times \underset{3}{6}} =$$

36 men, Ans.

9. 1 section of land = 1 sq. mi.; 1 sq. mi. is 320 rd. long.

$$320^2 + 320^2 = 102400 + 102400 = 204800.$$

$$\sqrt{204800} = 452.54 \text{ rd. diagonal.}$$

$$\frac{452.54}{2} = 226.27 \text{ rd. from the centre to each corner, Ans.}$$

10. 24 ft. 6 in. =  $24\frac{1}{2}$  ft.; 20 ft. 9 in. =  $20\frac{3}{4}$  ft.

$$8 \text{ in.} = \frac{2}{3} \text{ ft.}$$

$$\frac{49 \times 83 \times \frac{2}{3}}{\frac{2}{3} \times 4 \times 3} = \frac{4067}{12} = 338\frac{11}{12} \text{ cu. ft., Ans.}$$

**Article 461**

1. 93 d. = term of discount.

Bank discount of \$1 for 93 d. at 8% = \$0.0206 $\frac{2}{3}$ .

Proceeds of \$1 = \$1 - \$0.0206 $\frac{2}{3}$  = \$0.9793 $\frac{1}{3}$ .

\$850  $\div$  \$0.9793 $\frac{1}{3}$  = \$867.94, face of note, Ans.

\$867.94.

March 30, 1881.

Ninety days after date I promise to pay to the order of Wm. White, eight hundred sixty-seven  $\frac{24}{100}$  dollars. Value received.

JOHN SMITH.

2.

$$3\frac{7}{8} \div .31 = \frac{31}{8} \times \frac{100}{31} = 12\frac{1}{2}; .31 \div 3\frac{7}{8} = \frac{31}{100} \times \frac{8}{31} = \frac{2}{25};$$

$$12\frac{1}{2} - \frac{2}{25} = 12\frac{11}{25}, \text{ Ans.}$$

3.

100% + 25% = 125%; \$46 = 125% of the cost.

$$\frac{\$46}{125} \times 100 = \$36.80, \text{ cost per ton. } 100\% + 18\frac{1}{4}\% = 118\frac{1}{4}\%.$$

$$118\frac{1}{4}\% \text{ of } \$36.80 = \$43.516, \text{ Ans.}$$

4. 80 ft. square = 80  $\times$  80 = 6400 sq. ft.

6400 sq. ft.  $\times$  12 = 76800 sq. ft. in 12 lots.

76800 sq. ft. = 1 $\frac{377}{83}$  acres.

$$\$50 \times 1\frac{377}{83} = \$88\frac{58}{83}, \text{ Ans.}$$

5. 348  $\div$  2 = 174 leaves in one book.

32  $\times$  174 = 5568 leaves in thirty-two books.

1 sheet makes eight octavo leaves.

5568  $\div$  8 = 696 sheets required.

$$696 \div 480 = 1\frac{2}{5} \text{ reams, Ans.}$$

6.  $100\% + 2\frac{1}{2}\% = 102\frac{1}{2}\%$ ;  $\$720 = 102\frac{1}{2}\%$ .

$$\frac{\$720}{102\frac{1}{2}} \times 100 = \$702.43\frac{2}{7}, \text{ amount expended.}$$

$$\$702.43\frac{2}{7} \div \$0.37 = 1898\frac{734}{1617} \text{ lb., Ans.}$$

7.  $5 \div 3 = 1\frac{2}{3}$ .

B does  $1\frac{2}{3}$  times as much business as A, and hence has the opportunity to make 7% on his capital  $1\frac{2}{3}$  times while A is making 9% on his capital once.  $1\frac{2}{3} \times 7\% = 11\frac{2}{3}\%$ , B's gain. 9%, A's gain.  $11\frac{2}{3}\% - 9\% = 2\frac{2}{3}\% = \text{gain of B more than A,}$  or  $\$26\frac{2}{3}$  on  $\$1000$  capital.

8.  $48 \text{ ft.} \times 3.1416 = 150.7968 \text{ ft. of fence.}$

$$\frac{150.7968 \text{ ft.}}{4} = 37.6992 \text{ ft. on 1 side of square.}$$

$$37.6992^2 = 1421.2296 \text{ sq. ft., area of square field.}$$

9.  $\$325.50 \times .01 \times 3\frac{1}{2} = \$11.067$ , interest at 1%.

$$\$77.469 \div \$11.067 = 7, \text{ or } 7\%.$$

$$\$1.80 \times .01 \times 3\frac{1}{2} = \$0.0612, \text{ interest of } \$1.80 \text{ at } 1\%.$$

$$\$2.259 - \$1.80 = \$0.459.$$

$$\$0.459 \div \$0.0612 = 7\frac{1}{2}, \text{ or } 7\frac{1}{2}\%; 7\frac{1}{2}\% - 7\% = \frac{1}{2}\%.$$

Hence B receives  $\frac{1}{2}\%$  more, Ans.

10.  $\sqrt{.0064} = .08$ ;  $\sqrt[3]{.0064} = .185+$ .

$$.185+ - .08 = .105+, \text{ Ans.}$$

### Article 462

1.  $13\frac{3}{4} : 37\frac{7}{8} = \$11.75 : x$

$$\frac{3 \times 303 \times 11.75}{41 \times 8} = \$32.56\frac{197}{228}, \text{ Ans.}$$

$$2. \quad 80 \times 20 \times 2\frac{1}{2} = 3600 \text{ cu. ft.} = 6220800 \text{ cu. in.}$$

$$10 \times 9 \times 4 = 360 \text{ cu. in. in 1 stone.}$$

$$6220800 \div 360 = 17280 \text{ stones, Ans.}$$

$$3. \quad 12\frac{1}{2} : 15 = \$4.20 : x$$

$$\begin{array}{r} 3 \quad 84 \\ 2 \times \cancel{15} \times \cancel{4.20} \\ \hline \cancel{25} \\ 5 \end{array} = \$5.04, \text{ Ans.}$$

$$4. \quad 7\frac{1}{2}\% \text{ of } \$250 = \$19.06\frac{1}{4}.$$

$$\$250 + \$19.06\frac{1}{4} = \$269.06\frac{1}{4}, \text{ cost of 1 share.}$$

$$25 \times \$269.06\frac{1}{4} = \$6726.56\frac{1}{4}, \text{ Ans.}$$

$$5. \quad \text{Interest of } \$840 \text{ for 4 mo. 3 d. at } 6\% = \$17.22.$$

Hence the note should be sold for \$17.22 less than its face.

$$6. \quad 25^2 - 15^2 = 625 - 225 = 400.$$

$$\sqrt{400} = 20 \text{ yd., perpendicular of triangle.}$$

$$\frac{20 \text{ yd.} \times 15 \text{ yd.}}{2} = 150 \text{ sq. yd.} = 1350 \text{ sq. ft.}$$

$$\$0.08\frac{1}{2} \times 1350 = \$112.50, \text{ Ans.}$$

7.

$$35 \times 30 \times 12 = 12600 \text{ cu. ft.}; \quad 40 \times 10 \text{ cu. ft.} = 400 \text{ cu. ft.}$$

$$12600 \div 400 = 31\frac{1}{2} \text{ minutes, Ans.}$$

$$8. \quad 4832 \text{ lb.} + 4628 \text{ lb.} + 4976 \text{ lb.} = 14436 \text{ lb.}$$

$$1124 \text{ lb.} + 1136 \text{ lb.} + 1142 \text{ lb.} = 3402 \text{ lb.}$$

$$14436 \text{ lb.} - 3402 \text{ lb.} = 11034 \text{ lb., net weight.}$$

$$11034 \text{ lb.} = 5.517 \text{ T.}$$

$$\$33.37\frac{1}{2} \times 5.517 = \$184.129\frac{1}{2}, \text{ Ans.}$$

9.  $\$1.20 \times 4000 = \$4800$ , value of the wheat.

$\frac{2}{3}$  of  $\$4800 = \$3200$ , value insured ;  $\frac{3}{4}$  of  $1\frac{1}{2}\% = 1\frac{1}{8}\%$ .

$\$3200 \times .01\frac{1}{8} = \$36$ , premium.

$\$4800 - \$3200 = \$1600$ .

$\$1600 + \$36 = \$1636$ , Ans.

## 10.

Principal . . . . .	\$ 6000.00
Int. from Oct. 1, 1879, to Jan. 1, 1880, 3 mo. . . . .	120.00
Amount . . . . .	<u>\$ 6120.00</u>
1st payment . . . . .	500.00
New principal . . . . .	<u>\$ 5620.00</u>
Int. from Jan. 1, 1880, to Sept. 10, 1880, 8 mo. 9 d. . . . .	310.97
Amount . . . . .	<u>\$ 5930.97</u>
2d payment . . . . .	1126.00
New principal . . . . .	<u>\$ 4804.97</u>
Int. from Sept. 10, 1880, to Mar. 31, 1881, 6 mo. 21 d. . . . .	214.62
Amount . . . . .	<u>\$ 5019.59</u>
3d payment . . . . .	2000.00
New principal . . . . .	<u>\$ 3019.59</u>
Int. from Mar. 31, 1881, to Aug. 10, 1881, 4 m. 10 d. . . . .	87.23
Amount . . . . .	<u>\$ 3106.82</u>
4th payment . . . . .	876.50
New principal . . . . .	<u>\$ 2230.32</u>
Int. from Aug. 10, 1881, to Oct. 1, 1885, 4y. 1 m. 21 d. . . . .	738.98
Amount due Oct. 1, 1885 . . . . . Ans.	<u>\$ 2969.30</u>

**Article 463.**

1. 70 rd.  $5\frac{1}{2}$  ft. =  $1160\frac{1}{2}$  ft. ; 52 rd.  $8\frac{1}{2}$  ft. =  $866\frac{1}{2}$  ft.

$1160\frac{1}{2}$  ft.  $\times$   $866\frac{1}{2}$  ft. =  $1005283\frac{1}{8}$  sq. ft.

$1005283\frac{1}{8}$  sq. ft. =  $23\frac{5}{8}$  acres.

$\$256 \times 23\frac{5}{8} = \$5908$ , Ans.

2. 
$$\begin{array}{r} 2 \overline{) \$ 725} = \text{Principal.} \\ \underline{3.625} = 1 \text{ month's interest.} \\ 9 \frac{2}{15} = \text{Time in months.} \\ \underline{32625} \\ 483 \frac{1}{3} \\ \$ 33.108 = \text{Interest at 6\%.} \\ 5.518 = \text{ " " 1\%.} \\ \$ 27.590 = \text{ " " 5\%.} \end{array}$$

3. 
$$\begin{array}{r} 600 \\ 600 \times 6 \text{ mo.} = 3600 \text{ mo.} \\ 600 \times 12 \text{ " } = 7200 \text{ " } \\ 600 \times 18 \text{ " } = 10800 \text{ " } \\ 600 \times 24 \text{ " } = 14400 \text{ " } \\ 600 \times 30 \text{ " } = 18000 \text{ " } \\ 600 \times 36 \text{ " } = 21600 \text{ " } \\ \hline 4200 \qquad \qquad \qquad ) 75600 \text{ mo.} \\ \hline 18 \text{ mo., equated time, Ans.} \end{array}$$

4.

$5 \times 5 \times 50 = 1250 \text{ cu. ft., contents of chimney if solid.}$   
 $1 \times 1 \times 50 \times 2 = 100 \text{ cu. ft., contents of the two flues.}$   
 $1250 \text{ cu. ft.} - 100 \text{ cu. ft.} = 1150 \text{ cu. ft., contents of bricks used.}$   
 $1728 \div (8 \times 4 \times 2) = 27 \text{ bricks in a cubic foot.}$

$1150 \times 27 \text{ bricks} = 31050 \text{ bricks in chimney, Ans.}$

5.  $100\% - 20\% = 80\%; \quad \$ 250 = 80\%.$

$$\frac{\$ 250}{80} \times 100 = \$ 312.50, \text{ cost of the carriage, Ans.}$$

6.  $12^2 + 5^2 = 144 + 25 = 169.$

$\sqrt{169} = 13 \text{ ft., hypotenuse of triangle.}$

$13 \text{ ft.} = \text{diameter of the wheel.}$

$13 \text{ ft.} \times 3.1416 = 40.8408 \text{ ft., Ans.}$



7. C's 9 sheep = 3 cows ; 3 cows + 4 cows = 7 cows.

D's 42 sheep = 14 cows.

A's 7 cows for 6 weeks = 42 cows for 1 week.

B's 3 cows for 13 weeks = 39 " " "

C's 7 cows for 7 weeks = 49 " " "

D's 14 cows for 5 weeks = 70 " " "

The entire number = 200 " " "

$\frac{42}{200}$  of \$ 75 = \$ 15.75, A's share.

$\frac{39}{200}$  of \$ 75 = \$ 14.62 $\frac{1}{2}$ , B's share.

$\frac{49}{200}$  of \$ 75 = \$ 18.37 $\frac{1}{2}$ , C's share.

$\frac{70}{200}$  of \$ 75 = \$ 26.25, D's share.

8. B has \$ 250 more than C.

A has \$ 250 + \$ 50 = \$ 300 more than C.

\$ 250 + \$ 300 = \$ 550 ; \$ 3000 - \$ 550 = \$ 2450.

$\frac{1}{3}$  of \$ 2450 = \$ 816 $\frac{2}{3}$ , C's share.

\$ 816 $\frac{2}{3}$  + \$ 250 = \$ 1066 $\frac{2}{3}$ , B's share.

\$ 816 $\frac{2}{3}$  + \$ 300 = \$ 1116 $\frac{2}{3}$ , A's share.

9.

$$80 : 1280 = 6^2 : x^2 \quad \frac{\overset{64}{1280} \times \overset{9}{36}}{\underset{20}{80}} = 576; \quad \sqrt{576} = 24 \text{ ft., Ans.}$$

10. A can do the work in  $\frac{1}{2}$  hour = 50 minutes. He can do  $\frac{1}{50}$  in 1 minute.

B can do  $\frac{1}{60}$  of the work in 1 hour, or 60 minutes. In one minute he can do  $\frac{1}{60}$  of  $\frac{1}{50}$  of the work, or  $\frac{1}{3000}$ .

$$\frac{1}{50} + \frac{1}{3000} = \frac{61}{1800}, \text{ A and B can do in 1 minute.}$$

To do  $\frac{1800}{61}$ , or the whole work, it will take

$$\frac{1800}{61} \div \frac{61}{1800} = 29\frac{1}{61} \text{ minutes, Ans.}$$

### Article 466.

- |           |             |
|-----------|-------------|
| 1. 39.    | 7. XXIX.    |
| 2. 83.    | 8. LXXIII.  |
| 3. 419.   | 9. XCVIII.  |
| 4. 11222. | 10. CLXI.   |
| 5. 2544.  | 11. MDLXXX. |
| 6. 1898.  | 12. MMDCCC. |

13. MDCCLXXVI.

### Article 474.

16.	17.
$0.75\dot{3} = \frac{753}{999} = \frac{251}{333}, \text{ Ans.}$	$0.59\dot{4} = \frac{594}{999} = \frac{22}{37}, \text{ Ans.}$

18.  $0.42\dot{5} = \frac{425}{10} = \frac{421}{99} \times \frac{1}{10} = \frac{421}{990}, \text{ Ans.}$

19.  $7.34\dot{5} = 7 \frac{345}{100} = 7\frac{311}{100} = \frac{6611}{900}, \text{ Ans.}$

20.  $0.13\dot{5} = \frac{135}{999} = \frac{5}{37}, \text{ Ans.}$

$$21. \quad 53.00\dot{2}4\dot{3} = 53\frac{243}{100} = 53\frac{243}{100} = \frac{196109}{3700}, \text{ Ans.}$$

$$22. \quad 29.25\dot{9} = 29\frac{259}{100} = 29\frac{259}{100}; \quad 25.0\dot{4}7 = 25\frac{47}{100}.$$

$$29\frac{259}{100} - 25\frac{47}{100} = 4\frac{212}{100} = 4.212\dot{9}5, \text{ Ans.}$$

$$23. \quad 5.9 = 5\frac{9}{10} = \frac{59}{10}; \quad 0.\dot{0}8 = \frac{8}{99}.$$

$$\frac{59}{10} \times \frac{8}{99} = \frac{472}{990} = \frac{236}{495} = .47\dot{6}, \text{ Ans.}$$

$$24. \quad 4.2\dot{7} = 4\frac{27}{10} = 4\frac{27}{10} = \frac{77}{18}; \quad 0.4\dot{2} = \frac{42}{99} = \frac{14}{33}.$$

$$\frac{77}{18} \div \frac{14}{33} = \frac{77}{18} \times \frac{33}{14} = \frac{121}{12} = 10.08\dot{3}, \text{ Ans.}$$

### Article 478.

$$25. \quad 120 \text{ ch. } 75 \text{ li.} = 120.75 \text{ ch.}$$

$$120.75 \text{ ch.} \div 80 = 1.509375 \text{ miles, Ans.}$$

$$26. \quad 30 \text{ ch. } 25 \text{ li.} = 30.25 \text{ ch.}; \quad 25 \text{ ch. } 40 \text{ li.} = 25.40 \text{ ch.}$$

$$30.25 \times 25.40 = 768.35 \text{ sq. ch.}$$

$$768.35 \text{ sq. ch.} \div 10 = 76.835 \text{ acres, Ans.}$$

$$27. \quad 14 \text{ ch. } 50 \text{ li.} = 14.5 \text{ ch.}; \quad 24 \text{ ch. } 20 \text{ li.} = 24.2 \text{ ch.}$$

$$\frac{14.5 \times 24.2}{2} = 175.45 \text{ sq. ch.}$$

$$175.45 \text{ sq. ch.} \div 10 = 17.545 \text{ acres, Ans.}$$

28.  $500 \times 1.15 = 575$  miles, Ans.

29.  $1 \text{ lb } 8 \frac{3}{4} \times 23 = 9720 \text{ gr.}$ ;  $9720 \div 20 = 486$ , Ans.

30.  $60 \times 8 = 480 \text{ m.}$ ;  $480 \text{ m.} \times 12 = 5760 \text{ m.,}$  Ans.

31.

$20000 \text{ lb.} \div 56 = 357 \frac{1}{7} \text{ bu.}$ ;  $\$0.63 \times 357 \frac{1}{7} = \$225$ , Ans.

32.  $\$19.50 \times 4 = \$78$ , cost;  $200 \text{ lb.} \times 4 = 800 \text{ lb.}$

$\$0.14 \times 800 = \$112$ , what it was sold for.

$\$112 - \$78 = \$34$ , gain, Ans.

### Article 481.

33. 22, Ans.

34.

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

### Article 486.

26. 
$$\begin{array}{r} 15 \overline{) 77^{\circ} \quad 2' \quad 48''} \\ \underline{\phantom{15} 5 \text{ h. } 8 \text{ min. } 11 \frac{1}{2} \text{ sec.,}} \end{array}$$
 Ans.

37. 
$$\begin{array}{r} 2^{\circ} \quad 20' \quad 15'' \\ 71 \quad 4 \quad 9 \\ \hline 15) \overline{73^{\circ} \quad 24' \quad 24''}, \text{ difference of longitude.} \\ \quad 4 \text{ h. } 53 \text{ min. } 37\frac{2}{3} \text{ sec., difference of time.} \\ \quad 6 \\ \hline 10 \text{ h. } 53 \text{ min. } 37\frac{2}{3} \text{ sec., A. M., Ans.} \end{array}$$

38. 
$$\begin{array}{r} 49 \text{ min. } 48\frac{1}{2} \text{ sec.} \\ 15 \\ \hline 12^{\circ} \quad 27' \quad 14'', \text{ Ans.} \end{array}$$

39. 
$$\begin{array}{r} 53 \text{ min. } 30 \text{ sec.} \\ 15 \\ \hline 13^{\circ} \quad 22' \quad 30'', \text{ Ans.} \end{array}$$

40. 
$$\begin{array}{r} 1 \text{ h. } 35 \text{ min. } 20 \text{ sec.} \\ 15 \\ \hline 23^{\circ} \quad 50' \quad 0'' \\ 69 \quad 50 \\ \hline 93^{\circ} \quad 40'', \text{ west, Ans.} \end{array}$$

**Article 493.**

44. From Jan. 1, 1880, to Apr. 1, 1884, = 4 y. 3 mo.

Principal . . . . .	\$ 600.00	
1st annual interest . . . . .	\$ 36.00	
Int. on 1st annual int. 3 y. 3 mo. . .		\$ 7.02
2d annual interest . . . . .	36.00	
Int. on 2d annual int. 2 y. 3 mo. . .		4.86
3d annual interest . . . . .	36.00	
Int. on 3d annual int. 1 y. 3 mo. . .		2.70
4th annual interest . . . . .	36.00	
Int. on 4th annual int. 3 mo. . . .		0.54
5th annual interest . . . . .	9.00	
	<u>\$ 600.00</u>	<u>\$ 153.00</u>
Total interest, \$ 153 + \$ 15.12 . .	168.12	
Amount due . . . . .	<u>\$ 768.12,</u>	Ans.

## 45.

From May 16, 1881, to Mar. 16, 1884, = 2 y. 10 mo.

Principal . . . . .	\$ 1250.00		
1st annual interest . . . . .		\$ 62.50	
Int. on 1st annual int. 1 y. 10 mo. . . . .			\$ 5.73
2d annual interest . . . . .		62.50	
Int. on 2d annual int. 10 mo. . . . .			2.60
3d annual interest . . . . .		52.08	
	<u>\$ 1250.00</u>	\$ 177.08	\$ 8.33
Total interest, \$ 177.08 + \$ 8.33 . . . . .	185.41		
Amount due . . . . .	<u>\$ 1435.41,</u>	Ans.	

## 46.

From Mar. 14, 1880, to Sept. 25, 1883, = 3 y. 6 mo. 11 d.

Principal . . . . .	\$ 576.00		
1st annual interest . . . . .		\$ 34.56	
Int. on 1st annual int. 2 y. 6 mo. 11 d. . . . .			\$ 5.25
2d annual interest . . . . .		34.56	
Int. on 2d annual int. 1 y. 6 mo. 11 d. . . . .			3.17
3d annual interest . . . . .		34.56	
Int. on 3d annual int. 6 mo. 11 d. . . . .			1.10
4th annual interest . . . . .		18.34	
	<u>\$ 576.00</u>	\$ 122.02	\$ 9.52
Total interest, \$ 122.02 + \$ 9.52 . . . . .	131.54		
Amount due . . . . .	<u>\$ 707.54,</u>	Ans.	

**Article 494.****48.**

Principal drawing interest from

April 1, 1873.....	\$ 2000.00		
1st annual int. due April 1, 1874		\$ 120.00	
Interest on same (2 years) .....			\$ 14.40
2d annual int. due April 1, 1875		120.00	
Interest on same (1 year).....			7.20
3d annual int. due April 1, 1876		120.00	
Amount due April 1, 1876 .....		<u>\$ 2000.00 + \$ 360.00 + \$ 21.60</u>	
1st payment Sept. 19, 1875.....	\$ 500.00		
Interest on same to April 1, 1876 (6 mo. 13 d.) .....		16.08	
Amount of pay't to April 1, 1876	<u>\$ 516.08 =</u>	<u>134.48 + 360.00 + 21.60</u>	
Prin. drawing int. fr. Apr. 1, 1876		<u>\$ 1865.52</u>	
4th annual int. due April 1, 1877		\$ 111.93	
Interest on same (3 years).....			\$ 20.15
5th annual int. due April 1, 1878		111.93	
Interest on same (2 years).....			13.43
6th annual int. due April 1, 1879		111.93	
Interest on same (1 year) .....			6.72
7th annual int. due April 1, 1880		111.93	
Amount due April 1, 1880.....		<u>\$ 1865.52 + \$ 447.72 + \$ 40.30</u>	
2d payment, Dec. 3, 1879 .....	600.00		
Interest on same to April 1, 1880 (3 mo. 29 d.).....		11.90	
	<u>\$ 611.90 =</u>	<u>123.88 + 447.72 + 40.30</u>	
Prin. drawing int. fr. Apr. 1, 1880		<u>\$ 1741.64</u>	
8th annual int. due April 1, 1881		\$ 104.50	
Amount due April 1, 1881.....		<u>\$ 1741.64 + \$ 104.50</u>	
3d payment, Aug. 9, 1880 .....	775.00		
Interest on same to April 1, 1881		30.10	
	<u>\$ 805.10 =</u>	<u>700.60 + 104.50</u>	
Principal on int. fr. Apr. 1, 1881		<u>\$ 1041.04</u>	
9th annual int. due April 1, 1882		\$ 62.46	
Interest on same (1 y. 1 m. 18 d.)			\$ 4.25
10th annual int. due Apr. 1, 1883		62.46	
Interest on same (1 m. 18 d.).....			0.50
Final int. on principal to May 19 (1 mo. 18 d.).....		8.33	
Amount due May 19, 1883.....	<u>\$ 1179.04 =</u>	<u>\$ 1041.04 + \$ 133.25 + \$ 4.75</u>	

## 49.

Principal on int. fr. Jan. 13, 1874	\$5000.00		
1st annual int. due Jan. 13, 1875		\$300.00	
Int. on same to Jan. 13, '79 (4 y.)			\$72.00
2d annual int. due Jan. 13, 1876		300.00	
Int. on same to Jan. 13, '79 (3 y.)			54.00
3d annual int. due Jan. 13, 1877		300.00	
Int. on same to Jan. 13, '79 (2 y.)			36.00
4th annual int. due Jan. 13, 1878		300.00	
Int. on same to Jan. 13, '79 (1 y.)			18.00
5th annual int. due Jan. 13, 1879		300.00	
Amount due Jan. 13, 1879.....	<u>\$5000.00</u> + <u>\$1500.00</u> + <u>\$180.00</u>		
1st payment, Sept. 23, 1878 ..... \$2000.00			
Interest on same to Jan. 13, 1879			
(3 mo. 21 d.).....	37.00		
Amount of payment Jan. 13, 1879	<u>\$2037.00</u>	=	<u>357.00</u> + <u>1500.00</u> + <u>180.00</u>
New prin. on int. fr. Jan. 13, '79	<u>\$4643.00</u>		
6th annual int. due Jan. 13, 1880		\$278.58	
Interest on same to Jan. 13, 1881			\$16.71
7th annual int. due Jan. 13, 1881		278.58	
Amount due Jan. 13, 1881.....	<u>\$4643.00</u> + <u>\$557.16</u> + <u>\$16.71</u>		
2d payment Feb. 19, 1880.....	1500.00		
Int. on same to Jan. 13, 1881			
(10 mo. 25 d.).....	81.25		
	<u>\$1581.25</u>	=	<u>1007.38</u> + <u>557.16</u> + <u>16.71</u>
New prin. on int. fr. Jan. 13, '81	<u>\$3665.62</u>		
8th annual int. due Jan. 13, 1882		\$218.14	
3d payment, May 29, 1881, there being nothing but annual int. due, draws no int. but goes to cancel annual int. due.....			125.00
Balance of 8th annual interest due Jan. 13, 1882.....		\$93.14	
Int. on same to Jan. 13, '84 (2 y.)			\$11.18
9th annual int. due Jan. 13, 1883		218.14	
Int. on same to Jan. 13, '84 (1 y.)			
10th annual int. due Jan. 13, '84		218.14	13.09
Amount due, Jan. 13, 1884.....	<u>\$3665.62</u> + <u>\$529.42</u> + <u>\$24.27</u>		
4th payment, June 11, 1883.....	20.00		
Interest on same to Jan. 13, '84...	0.71		
	<u>\$20.71</u>		



Amount brought forward .....	\$3665.62 + \$529.42 + \$24.27	
Amount of 4th payment, which goes to cancel int. on annual int.		20.71
Bal. of simple int. due Jan. 13, '84		\$3.56
Unchanged principal.....	\$3665.62	
Accrued annual interest.....	\$529.42	
Interest on same to settlement (1 y. 7 mo. 17 d.).....		51.80
11th annual int. due Jan. 13, '85	218.14	
Interest on same to settlement (7 mo. 17 d.).....		8.25
Int. of principal from Jan. 13, '85, to settlement (7 mo. 17 d.).....		137.54
Amount due at settlement.....	$\$4584.33 = \$3665.62 + \$885.10 + \$63.61$	

**Article 497.**

51.	Debits.		Credits.
July 10, 149 × 0 d. =	0 d.	July 15, 650 × 5 d. =	3250 d.
" 20, 601 × 10 d. =	6010 d.		
\$ 750	6010 d.	\$ 650	3250 d.
650			
\$ 100, balance	3250 d.		
	2760 d.		

$$2760 \div 100 = 27\frac{3}{4} = 28 \text{ days.}$$

July 10, 1881, + 28 d. = Aug. 7, 1881, average time, Ans.

52.	Debits.		Credits.
Oct. 30, 550 × 0 d. =	0 d.	Oct. 31, 400 × 1 d. =	400 d.
Nov. 14, 850 × 15 d. =	12750 d.	Nov. 4, 30 × 5 d. =	150 d.
\$ 1400	12750 d.	\$ 430	550 d.
430	550 d.		
\$ 970, balance	12200 d.		

$$12200 \div 970 = 12\frac{4}{7} = 13 \text{ days.}$$

Oct. 30, 1881, + 13 d. = Nov. 12, 1881, average time, Ans.

53. <i>Debits.</i>		<i>Credits.</i>	
Mar. 2, 600 × 0 d. = 0 d.		Mar. 14, 400 × 12 d. = 4800 d.	
<u>\$ 600</u>	<u>0 d.</u>	<u>\$ 400</u>	<u>4800 d.</u>
400			0 d.
<u>\$ 200, balance.</u>			<u>4800 d.</u>

$$4800 \div 200 = 24 \text{ days.}$$

Mar. 2 — 24 d. = Feb. 6, average time, Ans.

54.			
<i>Debits.</i>		<i>Credits.</i>	
1881.		1881.	
Sept. 1, 150 × 0 d. = 0 d.		Sept. 11, 60 × 10 d. = 600 d.	
Dec. 10, 200 × 100 d. = 20000 d.		Dec. 10, 140 × 100 d. = 14000 d.	
1882.		1882.	
Feb. 28, 200 × 180 d. = 36000 d.		Jan. 29, 100 × 150 d. = 15000 d.	
<u>\$ 550</u>	<u>56000 d.</u>	<u>\$ 300</u>	<u>29600 d.</u>
300	29600 d.		
<u>\$ 250, balance.</u>	<u>26400 d.</u>		

$$26400 \text{ d.} \div 250 = 105\frac{3}{4} = 106 \text{ days.}$$

Sept. 1, 1881, + 106 d. = Dec. 16, 1881, average time, Ans.

### Article 505

56.  $\$2545 \times \$0.012 = \$30.54$ , B's tax on property.

$\$30.54 + \$1.75 = \$32.29$ , B's entire tax.

57.  $\$9565 \times \$0.012 = \$114.78$ , C's tax on property.

$\$114.78 + \$1.50 = \$116.28$ , C's entire tax.

$\$1764 \times \$0.012 = \$21.168$ , D's tax on property.

$\$21.168 + \$1.50 = \$22.668$ , D's entire tax.

$\$5630 \times \$0.012 = \$67.56$ , E's tax on property.

$\$67.56 + \$1.50 = \$69.06$ , E's entire tax.

## 58.

$$\$1 \times 600 = \$600.$$

$$\$600 + \$348 = \$948, \text{ sum to be assessed on the polls.}$$

$$\$948 \div 600 = \$1.58, \text{ to be assessed on each poll.}$$

$$\$348 + \$1500 + \$12100 = \$13948, \text{ entire tax.}$$

$$\$13948 - \$948 = \$13000, \text{ to be assessed on the property.}$$

$$\$1500 - \$600 = \$900, \text{ of the county tax to be assessed on the property.}$$

$$\$900 \div \$1000000 = 0.0009, \text{ rate of taxation for county tax.}$$

$$\$12100 \div \$1000000 = 0.0121, \text{ rate of taxation for town tax.}$$

$$\$5000 \times 0.0009 = \$4.50, \text{ A's county tax on property.}$$

$$\$4.50 + \$1 = \$5.50, \text{ A's entire county tax.}$$

$$\$5000 \times 0.0121 = \$60.50, \text{ A's town tax.}$$

$$\$5.50 + \$60.50 + \$0.58 = \$66.58, \text{ A's entire tax.}$$

## Article 510.

$$59. \text{ £ } 725 \text{ 3 s. 4 d.} = \text{£ } 725\frac{1}{2}.$$

$$\$4.866\frac{1}{2} \times 725\frac{1}{2} = \$3529.02\frac{1}{20}.$$

$$\$7 \times 200 = \$1400, \text{ duty.}$$

$$\$3529.02\frac{1}{20} + \$1400 = \$4929.02\frac{1}{20}, \text{ Ans.}$$

$$60. 2664.5 \times 6 = 15987 \text{ francs.}$$

$$\$0.193 \times 15987 = \$3085.491.$$

$$\$3085.491 \times .60 = \$1851.2946, \text{ Ans.}$$

$$61. 36 \text{ lb.} \times 7880 = 283680 \text{ lb.}$$

$$283680 \text{ lb.} \div 2240 = 126\frac{3}{4} \text{ T.}$$

$$\$20 \times 126\frac{3}{4} = \$2532\frac{3}{4}, \text{ Ans.}$$

$$62. \$0.932 \times 11102.7 = \$10347.7164.$$

$$\$10347.7164 \times .25 = \$2586.9291, \text{ ad valorem duty.}$$

$$\$0.05 \times 50381 = \$2519.05, \text{ specific duty.}$$

$$\$2586.9291 + \$2519.05 = \$5105.9791, \text{ Ans.}$$

63.  $640.4 \times 2.05 = 1312.82$  marks.  
 $100\% - 8\% = 92\%$ ;  $1312.82 \times .92 = 1207.7944$ .  
 $\$0.238 \times 1207.7944 = \$287.455$ .  
 $\$287.455 \times .40 = \$114.982+$ , ad valorem duty.  
1 meter = 39.37 inches.  
 $39.37 \text{ in.} \times 640.4 = 25212.548 \text{ in.} = \text{length}$ .  
 $25212.548 \times 43\frac{1}{2} = 1096745.838 \text{ sq. in.}$   
1 sq. yd. = 1296 sq. in.  
 $1096745.838 \div 1296 = 846.254 \text{ sq. yd.}$   
 $\$0.08 \times 846.254 = \$67.70+$ , specific duty.  
 $\$114.982 + \$67.70 = \$182.682+$ , Ans.

### Article 514.

64.  $\frac{1}{4}$  of 42 in. = 10.5 in.;  $10.5^2 = 110.25$ .  
 $30 \times 110.25 = 3307.5$ .  
 $3307.5 \div 144 = 22\frac{3}{8} = 22.96+$  cu. ft., Ans.
65.  $\frac{1}{4}$  of 60 in. = 15 in.;  $15^2 = 225$ .  
 $24 \times 225 = 5400$ .  
 $5400 \div 144 = 37\frac{1}{2}$  cu. ft., Ans.

### Article 515.

66.  $21 \text{ in.} \times 0.707 = 14.847 \text{ in.}$ , Ans.
67.  $24 \text{ in.} \times 0.707 = 16.968 \text{ in.} = 1.414 \text{ ft.}$   
 $18 \text{ ft.} \times 1.414 \text{ ft.} \times 16.968 \text{ in.} = 431.869536 \text{ bd. ft.}$ , Ans
68.  $6 \text{ ft.} = 72 \text{ in.}$ ;  $72 \text{ in.} \div 3.1416 = 22.918 \text{ in.} = \text{diameter}$   
 $22.918+ \times 0.707 = 16.20+ \text{ in.} = \text{side}$ .  
 $16.20 \div 12 = 1.35 \text{ ft.}$   
 $20 \text{ ft.} \times 1.35 \text{ ft.} \times 16.20 \text{ in.} = 437.4 \text{ bd. ft.}$   
 $437.4 \text{ bd. ft.} = 0.4374 \text{ thousand ft.}$   
 $\$30 \times 0.4374 = \$13.122$ , Ans.

**Article 518.**

69.  $22^2 = 484$ ;  $484 \times 30 = 14520$ .

$$14520 \times 0.0034 = 49.36\frac{4}{5} \text{ gal., Ans.}$$

70.  $30^2 = 900$ ;  $900 \times 38 = 34200$ .

$$34200 \times 0.0034 = 116.28 \text{ gal., Ans.}$$

71.  $30 \text{ in.} - 24 \text{ in.} = 6 \text{ in.}$ ;  $6 \times 0.7 = 4.2 \text{ in.}$

$$24 + 4.2 = 28.2, \text{ mean diameter.}$$

$$28.2^2, \text{ or } 795.24, \times 36 = 28628.64.$$

$$28628.64 \times 0.0129 = 369.309456 \text{ liters, Ans.}$$

72.  $4 \text{ ft. } 3 \text{ in.} = 4.25 \text{ ft.}$ ;  $3 \text{ ft. } 6 \text{ in.} = 3.5 \text{ ft.}$

$$4.25 \times 3.5 \times 4 = 59.5 \text{ cu. ft.}$$

$$1 \text{ cu. ft.} = 7\frac{1}{2} \text{ gal.}$$

$$59.5 \times 7\frac{1}{2} = 446.25 \text{ gal., Ans.}$$

**Article 520.**

73.  $\frac{3}{5}$  of  $20\frac{4}{5} \text{ ft.} = 12 \text{ ft.}$ ;  $75 \text{ ft.} - 12 \text{ ft.} = 63 \text{ ft.}$

$$63 \times 20 \times 9 = 11340.$$

$$11340 \div 95 = 119\frac{7}{19} \text{ tons, Ans.}$$

74.  $\frac{3}{5}$  of  $30\frac{6}{5} \text{ ft.} = 18 \text{ ft.}$ ;  $160 \text{ ft.} - 18 \text{ ft.} = 142 \text{ ft.}$

$$142 \times 30 \times 15 = 63900.$$

$$63900 \div 95 = 672\frac{1}{5} \text{ tons, Ans.}$$

**Article 526.**

75.  $8 \text{ ft.} \times 4 \text{ ft.} \times 3 \text{ ft.} = 96 \text{ cu. ft.}$

$$96 \text{ cu. ft.} \div 1\frac{1}{4} = 76\frac{2}{3} \text{ bu., Ans.}$$

76.  $8 \times 3\frac{1}{2} \times 2 = 56$  cu. ft.

$56 \div 1\frac{1}{4} = 44\frac{2}{3}$  bu. corn in the ear.

$44\frac{2}{3} \div 2 = 22\frac{2}{3}$  bu. shelled corn, Ans.

77.  $1200$  lb.  $\div 100$  lb. = 12.

$3$  lb.  $\times 12 = 36$  lb. per day each.

$36 \times 3 \times 120 = 12960$  lb.

$\frac{2}{3}$  of  $12960$  lb. =  $8640$  lb., Ans.

78.  $1$  bbl. flour =  $196$  lb.

Since  $33$  lb. less  $\frac{1}{6} = 1$  bu. wheat,

$196 \div 33 = 5\frac{2}{3}$  bu., Ans.

79.  $56$  lb. corn =  $100$  lb. meadow hay.

$1$  ton =  $2000$  lb. ;  $2000$  lb.  $\div 100$  lb. =  $20$ .

$100$  lb. hay cost \$  $0.75$ .

$\$0.75 \times 20 = \$15$ , cost per ton, Ans.

80.  $\frac{3}{5}$  of  $\overset{310}{\cancel{1550}}$  lb. =  $930$  lb., net weight.

$\frac{1}{5}$  of  $930$  lb. =  $186$  lb., rump and sirloin.

$186$  lb. round, Ans.

81.  $\frac{4}{5}$  of  $\overset{450}{\cancel{2250}}$  lb. =  $1800$  lb., net weight.

$\frac{1}{4}$  of  $1800$  lb. =  $450$  lb., hams and shoulders.

$\frac{1}{3}$  of  $1800$  lb. =  $600$  lb., clear pork, Ans.

**Article 532.**

**82.**  $900 \text{ sq. ft.} \div 9 = 100 \text{ sq. yd.}$

$100 \div 35 = 2\frac{2}{7} \text{ casks lime.}$

$\$0.90 \times 2\frac{2}{7} = \$2.57\frac{1}{7}, \text{ cost of lime.}$

$10 \times 2\frac{2}{7} = 28\frac{4}{7} \text{ bu. of sand.}$

$\$0.08 \times 28\frac{4}{7} = \$2.28\frac{4}{7}, \text{ cost of sand.}$

$5 \times 2\frac{2}{7} = 14\frac{2}{7} \text{ lb. of hair.}$

$\$0.06 \times 14\frac{2}{7} = \$0.85\frac{2}{7}, \text{ cost of hair.}$

$\$2.57\frac{1}{7} + \$2.28\frac{4}{7} + \$0.85\frac{2}{7} = \$5.71\frac{3}{7}, \text{ Ans.}$

**83.**  $224 \times 4 = 896 \text{ sq. ft.}; 896 \text{ sq. ft.} \div 9 = 99\frac{5}{9} \text{ sq. yd.}$

$99\frac{5}{9} \times 40 = 3982\frac{2}{3} \text{ bricks.}$

$3982\frac{2}{3} \div 1000 = 3.982\frac{2}{3} \text{ thousand bricks.}$

$\$7.50 \times 3.982\frac{2}{3} = \$29.86\frac{2}{3}, \text{ cost of bricks.}$

$99\frac{5}{9} \div 20 = 4\frac{4}{9} \text{ days' work.}$

$\$2.75 \times 4\frac{4}{9} = \$13.68\frac{8}{9}, \text{ mason's bill.}$

$\$1.50 \times 4\frac{4}{9} = \$7.46\frac{2}{3}, \text{ helper's bill.}$

$\$29.86\frac{2}{3} + \$13.68\frac{8}{9} + \$7.46\frac{2}{3} = \$51.02\frac{2}{3}, \text{ Ans.}$

**84.**  $40 \times 24 = 960 \text{ sq. ft.} = 106\frac{2}{3} \text{ sq. yd.}$

1 cask will concrete 9 sq. yd.

$106\frac{2}{3} \div 9 = 11\frac{2}{3} \text{ casks of cement.}$

$\$2 \times 11\frac{2}{3} = \$23.70\frac{2}{3}, \text{ cost of cement.}$

$12 \text{ bu.} \times 11\frac{2}{3} = 142\frac{2}{3} \text{ bu. of gravel.}$

$\$0.08 \times 142\frac{2}{3} = \$11.37\frac{2}{3}, \text{ cost of gravel.}$

$\$23.70\frac{2}{3} + \$11.37\frac{2}{3} = \$35.08\frac{4}{7}, \text{ Ans.}$

85.  $100 \times 6 = 600$  sq. ft.

$12 \times 2 = 24$  bricks per sq. ft. (Art. 529.)

$24 \times 600 = 14400$  bricks = 14.4 thousand.

$\$8 \times 14.4 = \$115.20$ , cost of bricks.

$14400 \div 1000 = 14.4$  casks of lime. (Art. 530.)

$\$1.10 \times 14.4 = \$15.84$ , cost of lime.

$10 \times 14.4 = 144$  bu. of sand.

$\$0.10 \times 144 = \$14.40$ , cost of sand.

$14400 \div 2000 = 7.2$  days' work.

$\$3 \times 7.2 = \$21.60$ , mason's wages.

$\$1.75 \times 7.2 = \$12.60$ , helper's wages.

$\$115.20$

15.84

14.40

21.60

12.60

$\$179.64$ , Ans.

86.  $(34 + 27)$  or 61 ft.  $\times 2 = 122$  ft.

$122 \times 9 = 1098$  sq. ft. = 122 sq. yd. ;  $1\frac{1}{2}$  ft. =  $\frac{1}{2}$  yd.

$122$  sq. yd.  $\times \frac{1}{2} = 61$  cu. yd.

$\frac{1}{2} \times \frac{1}{2} \times 3 \times 4 = 3$  cu. yd. in corners.

$61$  cu. yd. +  $3$  cu. yd. =  $64$  cu. yd. in walls.

$1\frac{1}{2} \times 64 = 76\frac{2}{3}$  cu. yd. undressed stone.

1 perch, or  $24\frac{3}{4}$  cu. ft.,  $\div 27 = \frac{11}{12}$  cu. yd.

$76\frac{2}{3}$  cu. yd.  $\div \frac{11}{12} = 83\frac{4}{3}$  perches required.

$\$2.50 \times 83\frac{4}{3} = \$209.45\frac{5}{6}$ , cost of stone.



$$\frac{1}{5} \text{ cu. yd.} \times 64 = 12\frac{2}{5} \text{ cu. yd., mortar required.}$$

$$15 \text{ cu. ft.} \div 27 = \frac{5}{9} \text{ cu. yd., mortar for 1 cask of lime.}$$

$$12\frac{2}{5} \text{ cu. yd.} \div \frac{5}{9} = 23\frac{1}{5} \text{ casks of lime.}$$

$$\$1.00 \times 23\frac{1}{5} = \$23.04, \text{ cost of lime.}$$

$$10 \times 23\frac{1}{5} = 230\frac{2}{5} \text{ bu. of sand.}$$

$$\$0.10 \times 230\frac{2}{5} = \$23.04, \text{ cost of sand.}$$

$$1 \text{ day's work} = 3 \text{ cu. yd. (Art. 528.)}$$

$$64 \div 3 = 21\frac{1}{3} \text{ day's work.}$$

$$\$3.00 \times 21\frac{1}{3} = \$64.00, \text{ mason's wages.}$$

$$\$2.00 \times 21\frac{1}{3} = \$42.66\frac{2}{3}, \text{ helper's wages.}$$

$$\$209.45\frac{5}{11}, \text{ cost of stone.}$$

$$23.04, \quad \text{"} \quad \text{lime.}$$

$$23.04, \quad \text{"} \quad \text{sand.}$$

$$64.00, \quad \text{"} \quad \text{mason.}$$

$$42.66\frac{2}{3}, \quad \text{"} \quad \text{helper.}$$

$$\underline{\$362.20\frac{4}{3}}, \text{ Ans.}$$

### Article 538.

87.  $34 \times 25 \times 2 = 1700 \text{ sq. ft.}$

$$1000 \text{ shingles will cover } 107 \text{ sq. ft. (Art. 533.)}$$

$$1700 \div 107 = 15.887\frac{21}{107} \text{ thousand shingles.}$$

$$\text{A carpenter will lay 2 M. in 1 day. (Art. 535.)}$$

$$15\frac{21}{107} \div 2 = 7\frac{10}{107} \text{ days' work.}$$

$$6 \text{ lb. nails are allowed for 1 M. shingles.}$$

$$6 \text{ lb.} \times 15.888 = 95.328 \text{ lb. nails,}$$

$$\$2.50 \times 7\frac{10}{107} = \$19.85\frac{10}{107}, \text{ cost of labor, } \left. \vphantom{\$2.50 \times 7\frac{10}{107}} \right\} \text{ Ans.}$$

88.  $30 \text{ ft.} \times 63 \text{ ft.} = 1890 \text{ sq. ft.}$

100 clapboards cover 130 sq. ft. (Art. 534.)

$$1890 \div 130 = 14.53\frac{1}{3} \text{ hundred, Ans.}$$

89.  $64 \times 4 \times 2 = 512 \text{ sq. ft. on both sides.}$

$$512 \text{ sq. ft.} \div 9 = 56\frac{8}{9} \text{ sq. yd.}$$

$$56\frac{8}{9} \div 4 = 14\frac{2}{3} \text{ lb., paint for 1st coat.}$$

$$56\frac{8}{9} \div 4\frac{1}{2} = 12\frac{5}{9} \text{ lb., " 2d "}$$

The first coat requires  $16\frac{1}{2}$  lb. lead to  $7\frac{1}{2}$  lb. oil.

$$16\frac{1}{2} + 7\frac{1}{2} = 24 \text{ lb.}$$

$$\frac{16\frac{1}{2}}{24} \text{ or } \frac{11}{16} \text{ of } 14\frac{2}{3} \text{ lb.} = 9\frac{7}{8} \text{ lb., lead for 1st coat.}$$

$$\frac{7\frac{1}{2}}{24} \text{ or } \frac{5}{16} \text{ of } 14\frac{2}{3} \text{ lb.} = 4\frac{2}{3} \text{ lb., oil " "}$$

The 2d coat requires 20 lb. lead to  $7\frac{1}{2}$  lb. oil.

$$20 + 7\frac{1}{2} = 27\frac{1}{2} \text{ lb.}$$

$$\frac{20}{27\frac{1}{2}} \text{ or } \frac{8}{11} \text{ of } 12\frac{5}{9} = 9\frac{1}{3}\frac{2}{3} \text{ lb., lead for 2d coat.}$$

$$\frac{7\frac{1}{2}}{27\frac{1}{2}} \text{ or } \frac{3}{11} \text{ of } 12\frac{5}{9} = 3\frac{1}{3}\frac{2}{3} \text{ lb., oil " "}$$

$$9\frac{7}{8} + 9\frac{1}{3}\frac{2}{3} = 18\frac{8}{9}\frac{1}{3} \text{ lb., lead required.}$$

$$\$0.09 \times 18\frac{8}{9}\frac{1}{3} = \$1.70\frac{2}{3}\frac{2}{3}, \text{ cost of lead.}$$

$$4\frac{2}{3} + 3\frac{1}{3}\frac{2}{3} = 7\frac{2}{3}\frac{2}{3} \text{ lb., oil required.}$$

1 gallon oil weighs  $7\frac{1}{2}$  lb.

$$7\frac{2}{3}\frac{2}{3} \div 7\frac{1}{2} = 1\frac{2}{3}\frac{2}{3} \text{ gal., oil required.}$$

$$\$0.72 \times 1\frac{2}{3}\frac{2}{3} = \$0.75\frac{2}{3}\frac{2}{3}, \text{ cost of oil.}$$

$$\$1.70\frac{2}{3}\frac{2}{3} + \$0.75\frac{2}{3}\frac{2}{3} = \$2.46\frac{2}{3}\frac{2}{3}, \text{ cost of paint, Ans.}$$

$$56\frac{8}{9} \div 80 = \frac{32}{45} \text{ day's work.}$$

$$\$2.50 \times \frac{32}{45} = \$1.77\frac{7}{9}, \text{ painter's wages, Ans.}$$

90.  $(20 + 18)$  or 38 ft.  $\times 2 = 76$  ft. around the room.  
 $76 \times 10 = 760$  sq. ft. in walls.  
 $18 \times 20 = 360$  sq. ft. in ceiling.  
 $760$  sq. ft. +  $360$  sq. ft. =  $1120$  sq. ft.  
 $1120 - 108 = 1012$  sq. ft. =  $112\frac{2}{3}$  sq. yd.  
 $100$  laths will cover  $5\frac{1}{2}$  sq. yd. (Art. 535.)  
 $112\frac{2}{3} \div 5\frac{1}{2} = 20\frac{2}{3}$  hundred laths, Ans.  
 $20\frac{2}{3}$  hundred =  $2.0\frac{2}{3}$  thousand.  
 $7$  lb. nails are required for  $1$  M. laths. (Art. 536.)  
 $7$  lb.  $\times 2.0\frac{2}{3} = 14\frac{1}{3}$  lb. nails.  
 $\$0.04\frac{1}{2} \times 14\frac{1}{3} = \$0.644$ , cost of nails, Ans.
91.  $(64 + 40)$  or  $104$  ft.  $\times 2 = 208$  ft.  
 $208 \times 20 = 4160$  sq. ft. in sides.  
 $4160 - 360 = 3800$  sq. ft. =  $3800$  bd. ft.  
 $3800$  bd. ft. =  $3.8$  thousand ft.  
 $\$20 \times 3.8 = \$76$ , cost of boards, Ans.  
 $A$  day's work =  $1000$  ft. (Art. 535.)  
 $3.8$  thousand ft. =  $3.8$  days' work.  
 $3.8 \div 2 = 1.9$  days' work for each man.  
 $\$2.25 \times 1.9 = \$4.275$ , each man's wages, Ans.

**Article 543.**

94.  $(3 \times 99) + 5 = 302$ , Ans.
95.  $(\$0.00\frac{1}{3} \times 33) + 12 = \$0.23$ , Ans.
96.  $17 - \left(\frac{8}{9} \times 9\right) = 9$  mi., Ans.
97.  $(\$0.04 \times 15) + 5 = \$0.65$ , Ans.

**Article 544.**

99.  $\frac{(2 + 478)}{2} \times 86 = 20640$ , Ans.

$$100. \frac{(\$7 + \$51)}{2} \times 12 = \$348, \text{ Ans.}$$

**Article 546.**

$$103. 20^4 = 160000; 10 \times 160000 = 1600000, \text{ Ans.}$$

**104.**

$$1.06^3 = 1.191016; \$120 \times 1.191016 = \$142.92192, \text{ Ans.}$$

$$105. \text{ Amount of } \$1 \text{ for 1 y. at 6\%} = \$1.06, \text{ ratio.}$$

$$\$1.06^4 = \$1.26247696.$$

$$\$50 \times 1.26247696 = \$63.123848, \text{ Ans.}$$

**Article 547.**

$$107. 768 \times 2 = 1536; \frac{1536 - 6}{1} = 1530, \text{ Ans.}$$

$$108. \left(\frac{3}{4}\right)^4, \text{ or } \frac{81}{256}, \times 10 = \frac{405}{128}, \text{ last term.}$$

$$\frac{405}{128} \times \frac{3}{4} = \frac{1215}{512}.$$

$$\frac{10 - \frac{1215}{512}}{1 - \frac{3}{4}} = \frac{\frac{3905}{512}}{\frac{1}{4}} = \frac{3905}{128} = 30\frac{5}{128}, \text{ Ans.}$$

$$109. 1.06^3, \text{ or } 1.191016, \times 100 = \$119.1016, \text{ last term.}$$

$$\frac{\$119.1016 \times 1.06 - 100}{0.06} = \$437.4616, \text{ Ans.}$$

$$110. 4^9 = 262144 \times \$0.01 = \$2621.44, \text{ last term.}$$

$$\frac{\$2621.44 \times 4 - \$0.01}{4 - 1} = \$3495.25, \text{ Ans.}$$

**Article 548.**

1.  $.000050 \div .0625 = .0008$ . Ans. Eight ten-thousandths.

2.  $\frac{4}{5}$  of the goods were destroyed by fire.

$\frac{7}{12}$  of  $\frac{1}{5} = \frac{7}{60}$ , were damaged by water.

$\frac{1}{5} - \frac{7}{60} = \frac{12}{60} - \frac{7}{60} = \frac{5}{60} = \frac{1}{12}$ , were uninjured.

The uninjured goods were sold for \$4200.

$\$4200 \times 12 = \$50400$ , cost of the goods.

$\frac{4}{5}$  of \$50400 = \$40320, value of goods destroyed.

$\frac{7}{60}$  of \$50400 = \$5880, value of goods damaged.

$\frac{11}{16}$  of \$40320 = \$27720, the merchant's loss by fire.

$\frac{11}{16}$  of  $\frac{\$5880}{2} = \$2021.25$ , " " " water.

$\$27720 + \$2021.25 = \$29741.25$ , Ans.

3.  $2^m \times 1.3^m \times 1.5^m = 3.9^{cm}$ ;  $3.9^{cm} = 3.9^{kl}$ .

$1^{kl} = 10^{hl}$ ;  $10^{hl} \times 3.9 = 39^{hl}$ , Ans.

4.  $100\% - 8\% = 92\%$ ;  $\$230 = 92\%$ .

$\frac{\$230}{.92} \times 100 = \$250$ , cost of the lot.

$\$300 - \$250 = \$50$ , gain.

$\frac{50}{250} = \frac{1}{5}$ ;  $\frac{1}{5}$  of  $100\% = 20\%$ , Ans.

**Article 549.**

$$\begin{array}{l}
 7-1 \\
 2\frac{4}{8} \div \frac{4}{16} \times 2 = \frac{21}{8} \times \frac{1}{8} \times 2 = \frac{21}{32} = \frac{21}{79} = \frac{21}{32} \times \frac{5}{79} = \\
 \frac{2 - \frac{1}{4} \div 5}{2 - \frac{1}{8} \times \frac{1}{5}} = 2 - \frac{1}{40} = \frac{79}{40} = \frac{105}{316}, \text{ Ans.}
 \end{array}$$

$$2. \quad \frac{7}{5} + \frac{1}{3} + \frac{5}{8} = \frac{168}{120} + \frac{40}{120} + \frac{75}{120} = \frac{283}{120} = 2\frac{43}{120}, \text{ Ans.}$$

$$\frac{7}{5} \times \frac{1}{3} \times \frac{5}{8} = \frac{7}{24}, \text{ Ans.}$$

$$3. \quad 3'845'672'000 (1566.7+, \text{ Ans.}$$

1	
300	2845
150	
25	
475	2375
67500	470672
2700	
36	
70236	421416
7300800	49256000
28080	
36	
7328916	43973496
735706800	5282504000
328860	
49	
736035709	5152249963
	130254037

4.  $3'53'44''00'.50'00'00'00$  (1880.0001+. Ans.

$$\begin{array}{r}
 1 \\
 28 \overline{) 253} \\
 \underline{224} \\
 368 \overline{) 2944} \\
 \underline{2944} \\
 37600001 \overline{) 00.50000000} \\
 \underline{37600001} \\
 12399999
 \end{array}$$

5. 1 sq. meter = 1.196 sq. yd. = 10.764 sq. ft. Since 1 sq. ft. sustains 100 lb., 10.764 sq. ft. will sustain  $10.764 \times 100 = 1076.4$  lb.; hence, 1 sq. meter sustains 1076.4 lb. 1 kilogram = 2.2046 lb.  $1076.4 \div 2.2046 = 488.25+$  kilograms, Ans.

6.  $6\frac{1}{3}\%$  of \$25000 = \$1583 $\frac{1}{3}$ , cost of the horse.

$$\$1583\frac{1}{3} - \$1000 = \$583\frac{1}{3}, \text{ loss.}$$

$$\frac{583\frac{1}{3}}{1583\frac{1}{3}} = \frac{\overset{7}{1750}}{\underset{19}{3}} \times \frac{\underset{19}{3}}{4750} = \frac{7}{19}; \frac{7}{19} \text{ of } 100\% = 36\frac{4}{19}\%, \text{ Ans.}$$

### Article 550.

1.  $45007021 - 30026003 = 14981018$ .

$$100000000 - 14981018 = 85018982.$$

Eighty-five million eighteen thousand nine hundred eighty-two, Ans.

2.  $\frac{2}{3} + \frac{4}{15} = \frac{10}{15} + \frac{4}{15} = \frac{14}{15}$

$$\frac{14}{15} - \frac{1}{10} = \frac{28}{30} - \frac{3}{30} = \frac{25}{30} = \frac{5}{6}$$

$$\frac{1}{8} + \frac{1}{9} + \frac{1}{10} = \frac{45}{360} + \frac{40}{360} + \frac{36}{360} = \frac{121}{360}$$

$$\frac{\overset{11}{3}}{11} \text{ of } \frac{121}{360} = \frac{11}{120}; \frac{5}{6} \div \frac{11}{120} = \frac{100}{11} = 9\frac{1}{11}, \text{ Ans.}$$

3.  $375 \div .75 = 500$ ;  $.75 \div 375 = .002$ .

$500 + .002 = 500.002$ , Ans.

$500 - .002 = 499.998$ , Ans.

4. 2 T. 3 cwt. 48 lb. = 4348 lb.; 18 cwt. 75 lb. = 1875 lb.

$4348 \text{ lb.} - 1875 \text{ lb.} = 2473 \text{ lb., net weight.}$

$2473 \text{ lb.} \div 215 = 11\frac{11}{115} \text{ lb., weight of each package.}$

1 kilogram = 2.2046 lb.

$11\frac{11}{115} \text{ lb.} \div 2.2046 = 5.217 \text{ kilograms.}$

$5.217 \text{ kilograms} = 5 \text{ kilograms, } 217 \text{ grams, Ans.}$

5. Interest is money paid for the use of money.

*Rule.* — Multiply the principal by the rate, and the product by the time in years. The product of the principal by the rate = 1 year's interest, which being multiplied by the number of years gives the required interest.

6.  $1'84.'20'00'00$  ( 13.572+, Ans.

	1	
23	84	
	69	
265	1520	
	1325	
2707	19500	
	18949	
27142	55100	
	54284	

### Article 55L

1.  $315 = 3 \times 3 \times 5 \times 7$ .

$504 = 2 \times 2 \times 2 \times 3 \times 3 \times 7$ .

$441 = 3 \times 3 \times 7 \times 7$ .

$3 \times 3 \times 7 = 63$ , greatest common divisor.



**2.**

$$\frac{\frac{3}{4} - \frac{1}{5} \times \frac{10}{6}}{3\frac{1}{2} - 2\frac{2}{3}} = \frac{\frac{3}{4} - \frac{1}{3}}{\frac{20}{6} - \frac{17}{6}} = \frac{\frac{5}{12}}{\frac{1}{2}} = \frac{5}{6}; \quad \frac{2}{3} \times \frac{5}{\frac{5}{3}} = \frac{5}{9} = 0.555\bar{5}, \text{ Ans.}$$

3. 57 gal.  $3\frac{1}{2}$  pt. = 57.4375 gal.

1 hektoliter = 26.42 gallons.

$$57.4375 \div 26.42 = 2.17+ \text{ hektoliters, Ans.}$$

4. (18 ft. + 12 ft.), or 30 ft.,  $\times 2 = 60$  ft.

$$60 \text{ ft.} \times 10 \text{ ft.} = 600 \text{ sq. ft.} = 66\frac{2}{3} \text{ sq. yd.}$$

$$66\frac{2}{3} \text{ sq. yd.} \div 1\frac{1}{3} = \frac{200}{3} \times \frac{8}{9} = \frac{1600}{27} = 59\frac{7}{27} \text{ yd., Ans.}$$

5.  $100\% - 8\% = 92\%$ ; \$ 230 = 92 %.

$$\frac{\$230}{92} \times 100 = \$250, \text{ cost of the sugar.}$$

$$\$300 = \$250 - \$50, \text{ gain.}$$

$$\frac{50}{250} = \frac{1}{5}; \quad \frac{1}{5} \text{ of } 100\% = 20\%, \text{ Ans.}$$

**Article 552**

$$1. \frac{4\frac{2}{3}}{8\frac{2}{3}} = \frac{34}{7} \times \frac{10}{89} = \frac{340}{623}; \quad \frac{3}{7\frac{1}{2}} = \frac{2}{1} \times \frac{8}{\frac{57}{19}} = \frac{8}{19}$$

$$\frac{340}{623} \text{ of } \frac{8}{19}, \text{ or } \frac{2720}{11837}, \div \frac{6}{11} = \frac{14960}{35511} = .4212$$

$$\sqrt{0.4212} = 0.64+, \text{ Ans.}$$

$$2. .37 : 8.9 = 4.3 : x \quad \frac{8.9 \times 4.3}{.37} = 103.432432$$

$$\sqrt[3]{103.432432} = 4.69+, \text{ Ans.}$$

$$3. 8 \text{ in.} \div 12 = .6666\frac{2}{3} \text{ ft.}; 2.6666\frac{2}{3} \text{ ft.} \div 16\frac{1}{2} = .161\frac{1}{8}\frac{1}{2} \text{ rd.}$$

$$16.161\frac{1}{8}\frac{1}{2} \text{ rd.} \div 320 = 0.050\frac{4}{8}\frac{1}{8} \text{ mile, Ans.}$$

$$4. .1335 \text{ are} = 13.35^{\text{am}}; \sqrt{13.35^{\text{am}}} = 3.65+^{\text{m}}.$$

$$3.65+^{\text{m}} = 36.5^{\text{dm}}+, \text{ Ans.}$$

### Article 553.

$$1. 4\frac{1}{2} + 2\frac{1}{3} \div \frac{2}{3} = \frac{9}{2} + \frac{7}{3} \times \frac{3}{2} = \frac{9}{2} + \frac{7}{2} = \frac{16}{2} = 8, \text{ Ans.}$$

$$6\frac{1}{2} - 1\frac{1}{3} \times \frac{3}{2} = \frac{13}{2} - \frac{5}{3} \times \frac{3}{2} = \frac{13}{2} - \frac{5}{2} = \frac{8}{2} = 4, \text{ Ans.}$$

$$2. 6 = 2 \times 3; 8 = 2 \times 2 \times 2; 20 = 2 \times 2 \times 5.$$

$$36 = 2 \times 2 \times 3 \times 3.$$

$$2^3 \times 3^2 \times 5 = 360, \text{ least common multiple.}$$

$$2 = \text{greatest common divisor.}$$

$$3. 25 \text{ ft.} = 300 \text{ in.}; 1 \text{ meter} = 39.37 \text{ in.}$$

$$300 \text{ in.} \div 39.37 = 7.62 \text{ meters, Ans.}$$

4.

$$3'53'06''/41 (1879, \text{ Ans.})$$

	1
28	253
	224
367	2906
	2569
3749	33741
	33741

5. \$1 in gold was worth  $\$1.12\frac{1}{2}$ , currency.

$$\$1 \div 1.12\frac{1}{2} = \$0.88\frac{2}{3}, \text{ Ans.}$$

6. 100% = sum to be invested; 5% = commission.

$$\$1200 = 105\%; \quad \frac{\$1200}{105} \times 100 = \$1142\frac{2}{3}, \text{ Ans.}$$

### Article 554.

1. (1.) A composite number is a number having other factors than itself and one.

(2.) A factor of a number is one of the integers which produce the number when multiplied together.

(3.) An abstract number is one in which no particular kind of unit is named.

(4.) The cube root of a number is one of the three equal factors which produce it.

(5.) Equation of payments is the process of finding when several debts, due at different times, may be paid at one time without loss to either debtor or creditor.

2. 50 lb. 8 oz. = 608 oz.

$$\$20.59\frac{1}{4} \times 608 = \$12520.24, \text{ Ans.}$$

3. 1 mile =  $5280 \times 12$  in. = 63360 in.

$$63360 \div 39.37 = 1609.347 \text{ meters.}$$

$$1609.347 \text{ meters} = 1.6093+ \text{ kilometers, Ans.}$$

$$4. \quad \frac{2}{3} \text{ of } 7\frac{3}{4} = \frac{2}{3} \text{ of } \frac{31}{4} = \frac{31}{6}; \quad \frac{4}{5} \text{ of } 12\frac{1}{2} = \frac{4}{5} \text{ of } \frac{25}{2} = \frac{31}{3}$$

$$\frac{\frac{31}{6}}{\frac{31}{3}} = \frac{\cancel{31}}{6} \times \frac{3}{\cancel{31}} = \frac{1}{2}, \text{ Ans.}$$

$$\frac{2}{3} \text{ of } 7\frac{3}{4} = .6\bar{6} \times 7.75 = 5.166\bar{6}.$$

$$\frac{4}{5} \text{ of } 12\frac{1}{2} = .8 \times 12.91\bar{6} = 10.333\bar{3}. \quad \frac{5.166\bar{6}}{10.333\bar{3}} = .5.$$

5. He disposed of  $\frac{1}{2} + \frac{1}{3} + \frac{1}{4}$ , or  $\frac{13}{12}$ , of his income, which was manifestly impossible. His obvious intention was to dispose of it in the proportion of  $\frac{1}{2}$ ,  $\frac{1}{3}$ , and  $\frac{1}{4}$ , or  $\frac{6}{12}$ ,  $\frac{4}{12}$ ,  $\frac{3}{12}$ .

6 of the 13 twelfths, or  $\frac{6}{13}$ , of \$780, or \$360, was spent.

4 of the 13 twelfths, or  $\frac{4}{13}$ , of \$780, or \$240, was saved.

3 of the 13 twelfths, or  $\frac{3}{13}$ , of \$780, or \$180, was devoted to business.

6.  $\$125 \times .07\frac{1}{2} = \$9.375$ , interest for 1 year.

$$\$15 \div 9.375 = 1\frac{2}{3} \text{ years, Ans.}$$

7. The annual income of a share of 6% stock = \$6.

If the cost is \$75, the income is  $\frac{6}{75}$  of 100% = 8%, Ans.

8.  $.726'572'699$  (.899, Ans.

	512
19200	214572
2160	
81	
<u>21441</u>	192969
2376300	21603699
24030	
81	
<u>2400411</u>	21603699

**Article 555.**

1.  $\frac{\frac{1}{2}}{\frac{2}{3}} \times \frac{\frac{4}{5}}{\frac{5}{6}} \times \frac{\frac{5}{9}}{\frac{3}{4}} = \frac{1}{6}$

$$\frac{1}{6} + \frac{7}{15} + \frac{3}{4} + \frac{9}{10} = \frac{10}{60} + \frac{28}{60} + \frac{45}{60} + \frac{54}{60} = \frac{137}{60} =$$

$2\frac{17}{60}$ , Ar

2.  $\frac{\frac{4}{6\frac{1}{2}}}{\frac{2}{1}} \times \frac{\frac{7}{46}}{\frac{23}{23}} = \frac{14}{23}$ ;  $\frac{14}{23} - \frac{1}{7} = \frac{98}{161} - \frac{23}{161} = \frac{75}{161}$

$$\frac{75}{161} \div \frac{8}{11} = \frac{75}{161} \times \frac{11}{8} = \frac{825}{1288}, \text{ Ans.}$$

3.  $\frac{1}{\sqrt{3}} = \frac{1}{1.732} = 0.577+, \text{ Ans.}$

4.  $3.81 : 0.056 = 1.67 : x$

$$\frac{0.056 \times 1.67}{3.81} = 0.024384, \text{ Ans.}$$

5. 3 R. 13 sq. rd. 8 sq. ft. =  $36217\frac{1}{4}$  sq. ft.

1 acre = 43560 sq. ft.

$$36217.25 \div 43560 = 0.8314\frac{733}{2178} \text{ acre, Ans.}$$

6. (a)  $4^m \times 0.4^m = 1.6^{am}$ .

$$1.6^{am} \times 100 = 160^{ad}, \text{ Ans.}$$

(b)  $90^a = .009^m$ ;  $2700^m \div .009^m = 300000, \text{ Ans.}$

### Article 556.

$$1. \frac{1 + \frac{8}{3} + \left(\frac{4}{3}\right)^2}{\left(\frac{4}{3}\right)^2 - 1} = \frac{\frac{9}{9} + \frac{24}{9} + \frac{16}{9}}{\frac{16}{9} - \frac{9}{9}} = \frac{\frac{49}{9}}{\frac{7}{9}}$$

$$\frac{\frac{49}{9}}{\frac{7}{9}} = \frac{49}{9} \times \frac{9}{7} = 7, \text{ Ans.}$$

2. 1 kilometer 8 meters = 1008<sup>m</sup>.

$4\frac{1}{2}$  hektometers = 448<sup>m</sup>.

$1008^m \times 448^m = 451584^{am}$ .

$$\sqrt{451584} = 672^m = 67.2^{Dm}, \text{ Ans.}$$

3.

$$10 = 2 \times 5$$

$$12 = 2 \times 2 \times 3$$

$$14 = 2 \times 7$$

$$16 = 2 \times 2 \times 2 \times 2$$

$$18 = 2 \times 3 \times 3$$

$$20 = 2 \times 2 \times 5$$

$2^4 \times 3^2 \times 5 \times 7 = 5040, \text{ least common multiple, Ans.}$

$$4. \$2500 \times .01 \times \frac{1}{5} = \$5, \text{ int. at } 1\%.$$

$$\$45 \div \$5 = 9, \text{ or } 9\%, \text{ Ans.}$$

$$5. \left. \begin{array}{l} 30 : 25 \\ 10 : 8 \\ 3 : 5 \\ \frac{3}{8} : \frac{5}{8} \end{array} \right\} = 24 : x \quad \frac{\overset{5}{25} \times \overset{2}{8} \times \overset{4}{24} \times \overset{5}{5}}{\underset{6}{30} \times \underset{2}{10} \times 3} = \frac{80}{3} = 26\frac{2}{3} \text{ d., Ans.}$$

**Article 557.****1.**

20570.

6206.

98.007

63000.

426.000626

4287.

63.961

102030.

405.0607

8090.

543.21

1028848.414995

1234567.654321, Ans.

**2.** 1595864.**3.** LXXXIVDCCXCVI.

**4.** Twenty million five hundred sixty-seven thousand one hundred eighty-nine, and four million three hundred twenty-one thousand ninety-eight billionths.

5.  $96813 \overline{) 31984875832}$   $33037787311$ , Ans.

$$\begin{array}{r}
 290439 \\
 \hline
 294097 \\
 290439 \\
 \hline
 365858 \\
 290439 \\
 \hline
 754193 \\
 677691 \\
 \hline
 765022 \\
 677691 \\
 \hline
 87331
 \end{array}$$

6.  $(28 - 7) \times 6 = 21 \times 6 = 126.$

$(92 + 7) \div 9 = 99 \div 9 = 11.$

$(86 + 10) \div 12 = 96 \div 12 = 8.$

$126 + 11 - 8 = 129$ , Ans.

7.  $\frac{15 \times \overset{4}{\cancel{80}} \times 27 \times \overset{4}{\cancel{28}}}{\underset{2}{7} \times \underset{2}{20} \times \underset{2}{8}} = 810$ , Ans.

8.  $\frac{2}{21}, \frac{12}{87}, \frac{26}{169}, \frac{1}{4} = \frac{39208}{411684}, \frac{56784}{411684}, \frac{63336}{411684}, \frac{102921}{411684}.$

9.  $\frac{39208}{411684} + \frac{56784}{411684} + \frac{63336}{411684} + \frac{102921}{411684} = \frac{262249}{411684} =$   
 $.637\frac{121}{117}$ , Ans.

10.  $7955 = 5 \times 37 \times 43$ ;  $8769 = 3 \times 37 \times 79.$

$6401 = 37 \times 173$ ;  $37 =$  greatest common divisor, Ans.



11. 52 rd. 14 ft. 8 in. =  $872\frac{2}{3}$  ft.

$$\$0.75 \times 872\frac{2}{3} = \$654.50, \text{ Ans.}$$

12. The sun is at meridian in the more easterly of two places first, as his apparent daily journey is from the east towards the west.

Timepieces carried from the west to the east will be too slow by 1 hour for each  $15^\circ$  of travel. (Art. 486.) A traveler whose watch is 2 h. 22 min. slow has, therefore, traveled *eastward*  $2\frac{2}{3} \times 15^\circ$ , or  $35^\circ 30'$ , Ans.

13. 50 bushels =  $\frac{50}{30000}$  of 30000 bushels.

$$\frac{50}{30000} = \frac{1}{600}; \quad \frac{1}{600} \text{ of } 100\% = \frac{1}{6}\%.$$

.00 $\frac{1}{6}$ , or one sixth of one per cent, Ans.

14. The number = 100% of itself;  $100\% - 36\% = 64\%$ .  
 $336 = 64\%$  of the number.

$$\frac{\overset{21}{\cancel{336}}}{\underset{16}{\cancel{64}}} \times \frac{25}{\cancel{100}} = 525, \text{ Ans.}$$

15. 70 rd.  $\times$  20 rd. = 1400 sq. rd.

$$1400 \text{ sq. rd.} \div 160 \text{ sq. rd.} = 8\frac{3}{4} \text{ acres.}$$

$$\$47.25 \times 8\frac{3}{4} = \$413.43\frac{3}{4}, \text{ Ans.}$$

16. The first will fill  $\frac{1}{12}$  of it in 1 hour.

The second will fill  $\frac{1}{16}$  of it in 1 hour.

The third will fill  $\frac{1}{18}$  of it in 1 hour.

Together they will fill  $\frac{1}{12} + \frac{1}{16} + \frac{1}{18}$ , or  $\frac{29}{144}$ , in 1 hour.

To fill  $\frac{144}{144}$ , or the cistern, it will take as many hours as

$$\frac{144}{144} \div \frac{29}{144} = 4\frac{8}{29} \text{ h., Ans.}$$

$$12 \text{ h.} : 1 \text{ h.} = 1 \text{ cistern} : \frac{1}{12} \text{ cistern.}$$

$$16 \text{ " } : 1 \text{ " } = 1 \text{ " } : \frac{1}{16} \text{ "}$$

$$18 \text{ " } : 1 \text{ " } = 1 \text{ " } : \frac{1}{18} \text{ "}$$

$$\frac{29}{144} \text{ cistern} : \frac{144}{144} \text{ cistern} = 1 \text{ h.} : 4\frac{8}{29} \text{ h.}$$

17.  $\$328 \times .07 \times 2\frac{7}{2} = \$59.31$ , simple interest.

Principal for 1st year . . . . .	\$ 328.00
Interest " " . . . . .	19.68
Principal for 2d year. . . . .	<u>\$ 347.68</u>
Interest " " . . . . .	20.86
Principal for 7 mo. . . . .	<u>\$ 368.54</u>
Interest " " . . . . .	12.90
Compound amount for 2 y. 7 mo. . . . .	<u>\$ 381.44</u>
Given principal . . . . .	328.00
Compound interest for 2 y. 7 mo. . . . .	<u>\$ 53.44</u>

$$\$59.31 - \$53.44 = \$5.87, \text{ Ans.}$$

## 18.

Principal . . . . .	\$ 580.00
Int. from Jan. 1, 1879, to July 1, 1879, 6 mo. . . .	14.50.
Amount . . . . .	<u>\$ 594.50</u>
1st payment . . . . .	85.00
New principal . . . . .	<u>\$ 509.50</u>
Int. from July 1, 1879, to Jan. 1, 1880, 6 mo. . . .	12.74
Amount . . . . .	<u>\$ 522.24</u>
2d payment . . . . .	85.00
New principal . . . . .	<u>\$ 437.24</u>
Int. from Jan. 1, 1880, to July 1, 1880, 6 mo. . . .	10.93
Amount . . . . .	<u>\$ 448.17</u>
3d payment . . . . .	85.00
New principal . . . . .	<u>\$ 363.17</u>
Int. from July 1, 1880, to Jan. 1, 1881, 6 mo. . . .	9.08
Amount . . . . .	<u>\$ 372.25</u>
4th payment . . . . .	85.00
New principal . . . . .	<u>\$ 287.25</u>
Int. from Jan. 1, 1881, to March 4, 1881, 2 mo. 3 d.	2.51
Amount due March 4, 1881 . . . . .	<u>\$ 289.76</u>

$$19. \$1 \times .05 \times \frac{25}{36} = \$0.034\frac{1}{3}.$$

$$\$1 + \$0.034\frac{1}{3} = \$1.034\frac{1}{3}.$$

$$\$3725.87 \div \$1.034\frac{1}{3} = \$3600.84, \text{ present worth.}$$

$$\$3725.87 - \$3600.84 = \$125.03, \text{ discount, Ans.}$$

$$20. \$115 - \$110 = \$5, \text{ or } 5\%, \text{ loss.}$$

$$\$300 = 5\% \text{ of the value of the bonds.}$$

$$\frac{\$300}{5} \times \frac{20}{100} = \$6000, \text{ value of bonds.}$$

$$\$6000 \div \$1000 = 6, \text{ number of bonds, Ans.}$$

21. A's \$4000 for 8 mo. = \$32000 for 1 mo.  
 B's \$6000 " 7 " = \$42000 "  
 C's \$3500 " 12 " = \$42000 "  
 The entire stock = \$116000 for 1 mo.

$$\frac{32000}{116000} = \frac{8}{29}; \quad \frac{8}{29} \text{ of } \$2320 = \$640, \text{ A's share.}$$

$$\frac{42000}{116000} = \frac{21}{58}; \quad \frac{21}{58} \text{ of } \$2320 = \$840, \text{ B's "}$$

$$\frac{42000}{116000} = \frac{21}{58}; \quad \frac{21}{58} \text{ of } \$2320 = \$840, \text{ C's "}$$

22. 1 horse eats  $\frac{1}{5}$  of 6 =  $\frac{6}{5}$  as much as 1 ox.

$$8 \text{ horses eat } 8 \times \frac{6}{5} = 9\frac{3}{5}; \quad 9\frac{3}{5} + 12 = 21\frac{3}{5} \text{ oxen.}$$

$$7 \text{ " " } 7 \times \frac{6}{5} = 8\frac{3}{5}; \quad 8\frac{3}{5} + 15 = 23\frac{3}{5} \text{ "}$$

$$\left. \begin{array}{l} 21\frac{3}{5} : 23\frac{3}{5} \\ 40 : 65 \end{array} \right\} = 12 : x \quad \frac{\overset{13}{5} \times \overset{13}{65} \times \overset{13}{117} \times \overset{13}{12}}{\underset{9}{108} \times \underset{8}{40} \times \underset{5}{5}} = \frac{169}{8} = 21\frac{1}{8} \text{ T., Ans.}$$

23. 0.'000'238'328 ( 0.062, Ans.

	216
10800	22328
360	
4	
11164	22328

24. 15 mi.  $\times$  6 = 90 mi.; 18 mi.  $\times$  6 = 108 mi.  
 $90^2 + 108^2 = 8100 + 11664 = 19764.$

$$\sqrt{19764} = 140.5 \text{ mi., Ans.}$$

25. 1 bbl. =  $31\frac{1}{2}$  gal. ;  $300 \times 31\frac{1}{2}$  gal. = 9450 gal.  
1 gal. = 231 cu. in. ;  $9450 \times 231 = 2182950$  cu. in.  
 $\sqrt[3]{2182950} = 129.7$  in., length of 1 edge.  
129.7 in. = 3.6 yd. ;  $3.6^2 = 12.96$  sq. yd. in 1 side.  
 $12.96$  sq. yd.  $\times 4 = 51.84$  sq. yd. in 4 sides.  
 $3.6^2$  yd. = 12.96 sq. yd. in bottom.  
 $51.84$  sq. yd. +  $12.96$  sq. yd. =  $64.8$  sq. yd.  
 $\$0.30 \times 64.8 = \$19.44$ , Ans.

26. 5 ft.  $\times 3.1416 = 15.708$  ft. = circumference.

$$\frac{15.708}{2} \times \frac{5}{2} = 19.635 \text{ sq. ft., area, Ans.}$$

27. 5 ft. square =  $5 \times 5$  sq. ft. = 25 sq. ft.

$$25 \text{ sq. ft.} - 5 \text{ sq. ft.} = 20 \text{ sq. ft., Ans.}$$

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512

72

8





